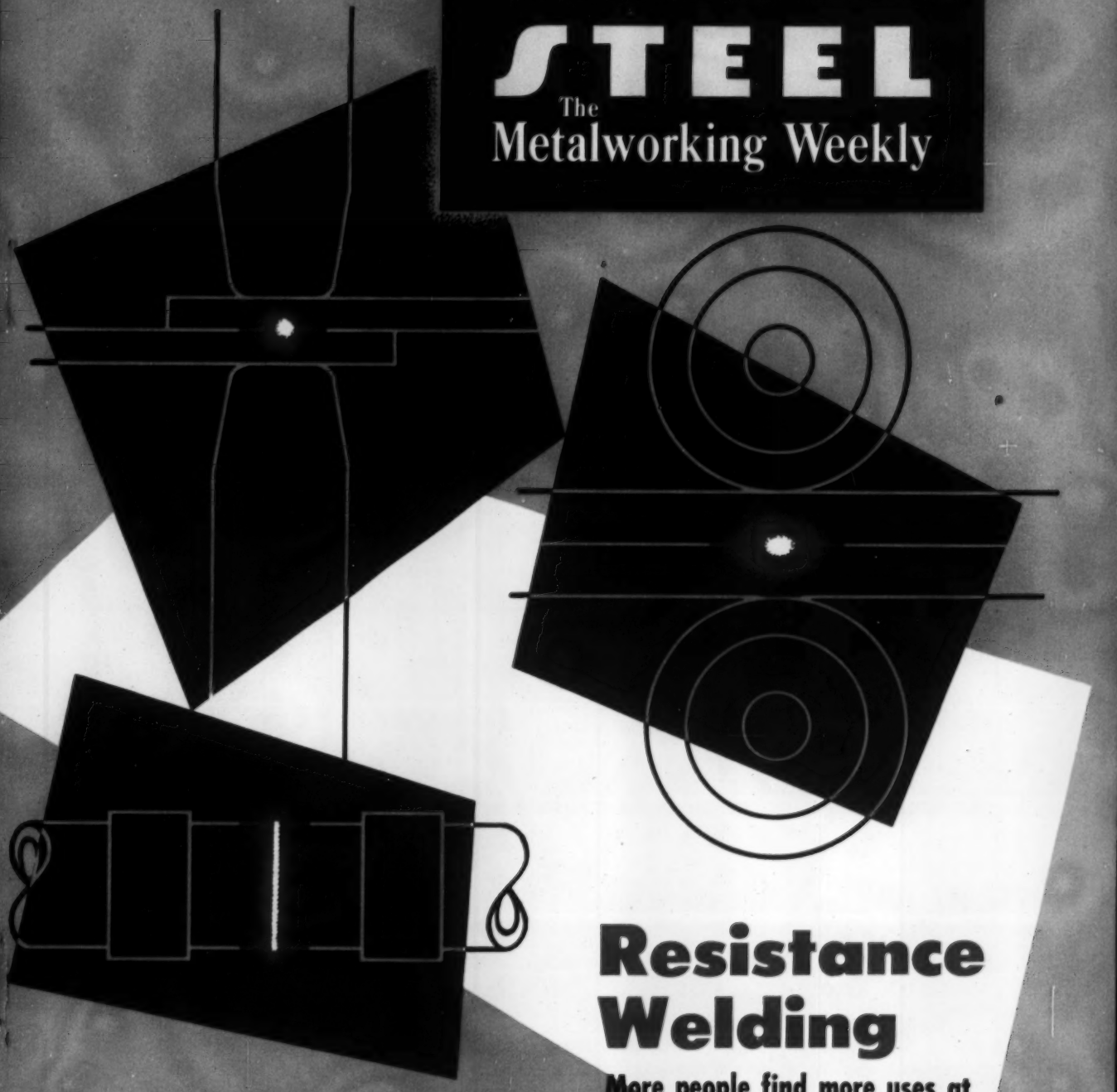
MAY 30, 1955

STEEL
The Metalworking Weekly



Resistance Welding

More people find more uses at less cost. Amortization takes months, not years . . . **page 70**

✓ **Steelmen Look at the Future** **page 35**

✓ **Galvanizing Goes Continuous** **page 107**

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save money, minutes, metal

with B&W MECHANICAL TUBING

CARBON • ALLOY • STAINLESS

Countless hollow parts and products now being made from solid stock can be fabricated more economically from tubing. The hole is there, eliminating heavy drilling with all its attendant waste. And the wide range of sizes, shapes, analyses, finishes and heat-treated conditions in which B&W Mechanical Tubing is available, make it a semi-finished product in itself—reduce all your machining operations to the minimum.

Get the facts on savings from Mr. Tubes, your link to B&W and your local B&W tubing distributor.

Write for Guide to the Use of Seamless Mechanical Tubing, Technical Bulletin 340 S.

B&W TUBULAR PRODUCTS DIVISION

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5031 (O)

Crane wheels are one of the many types of products made from Bethlehem blanks. Here a wheel, bearing, axle, and coupling are being assembled at the plant of Whiting Corporation, builder of high-quality industrial machinery.

How to be sure of high strength in a circular forging

Strength is often the very first requirement in a heavy-duty circular part. Bethlehem forged-and-rolled circular blanks give you consistently high strength, *without excessive weight.*

How is this done? The answer lies in Bethlehem's unique process of manufacture. The steel blanks are not just forged, not just rolled, but *both* — in a most unusual mill that combines the steps as a single operation. The mill is thus able to produce a uniform product — one so strong that customers can often specify lighter blanks than they formerly used.

Bethlehem forged-and-rolled blanks are used in gears, crane wheels, industrial wheels, turbine rotors, clutch and brake drums, sheave wheels, flywheels, tire molds, pipe flanges, and many other circular products. The blanks are available in sizes from 10 to 42 in. OD and can be furnished either heat-treated or untreated. For further details, ask for a copy of illustrated Booklet 216; it will be sent to you promptly without cost or obligation of any kind.

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BETHLEHEM STEEL

BETHLEHEM STEEL

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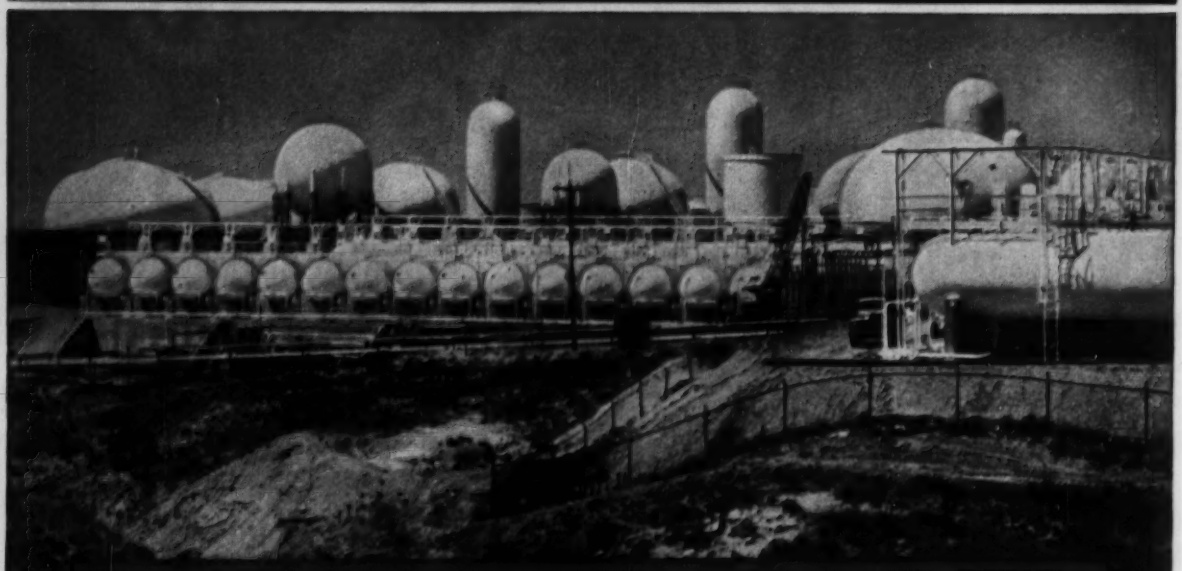

RELY ON PHILLIPS PETROLEUM COMPANY FOR DEPENDABLE SUPPLY!

Phillips tremendous manufacturing, transportation and storage facilities provide dependable supplies of Philgas when and where you need it, even in periods of peak demand. The modern processing plant pictured above is one of Phillips many installations engaged in the manufacture of Philgas. Pipelines carry Philgas to strategically situated underground storage facilities. Phillips maintains its own fleets of tank cars and trucks to insure prompt deliveries.

● There is no cleaner fuel than Philgas. This quality LP-Gas is produced and processed by Phillips Petroleum Company to rigid standards of purity. It is free from harmful contaminants. You can rely on it for high thermal values, uniform gravity and pressures. In addition, the automatic features of a Philgas system keep your labor costs low.

Leading industries are using Philgas profitably for core baking, mold drying, heat treating, ceramic operations, food processing, textile finishing, space heating, metal cutting, and as a clean, economical motor fuel. Write for full information. It will pay you to find out how Philgas can cut down your operating costs . . . and how it can increase your profits.

Philgas is our name for high quality LP-Gas—Bottled Gas—Butane—Propane

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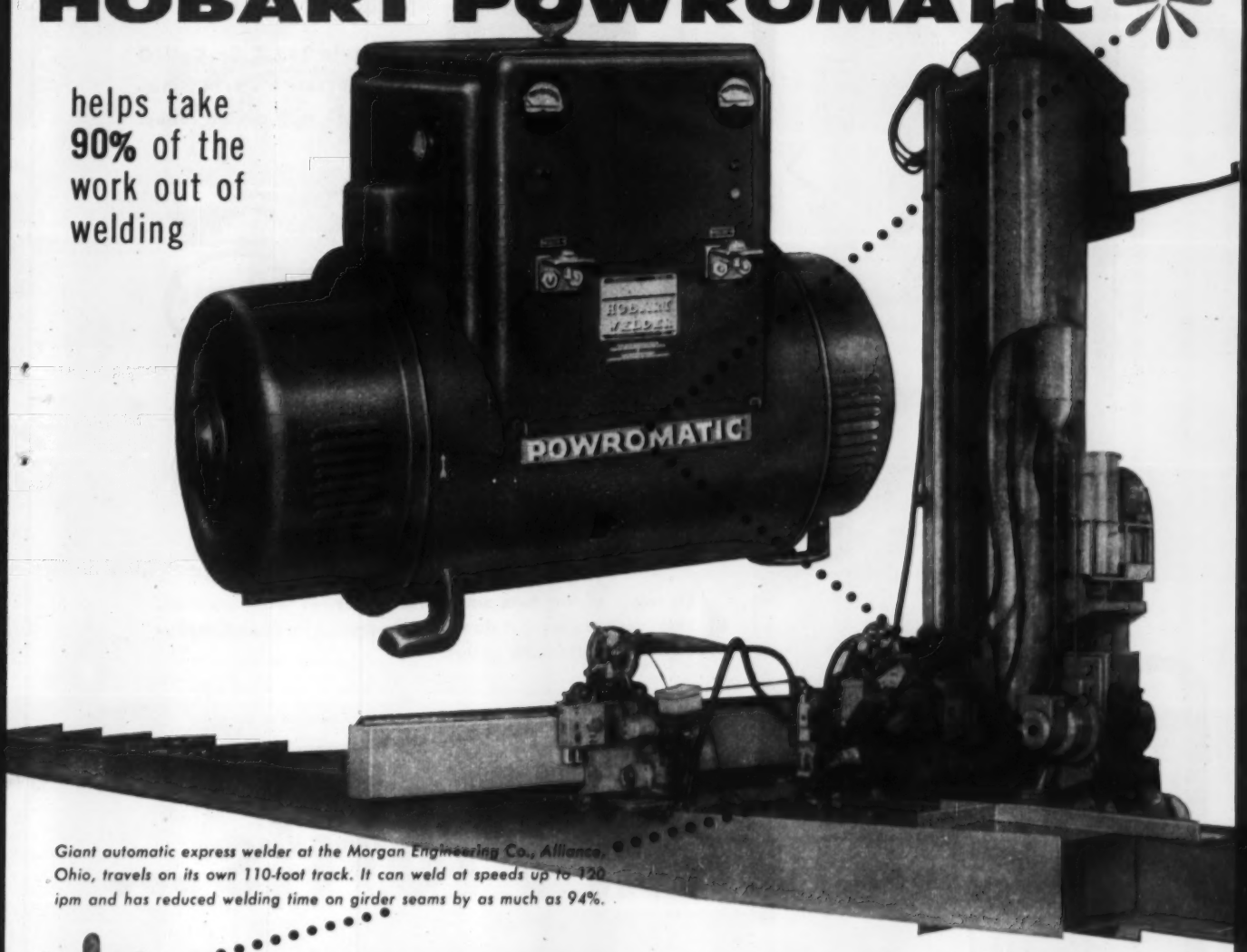
helps take **90%** of the work out of welding



Giant automatic express welder at the Morgan Engineering Co., Alliance, Ohio, travels on its own 110-foot track. It can weld at speeds up to 120 ipm and has reduced welding time on girder seams by as much as 94%.

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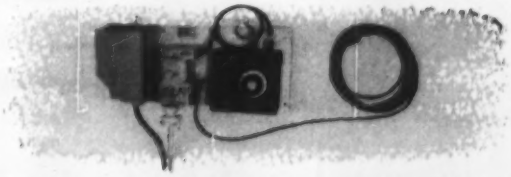

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Without obligation, please send me complete information on items checked below.

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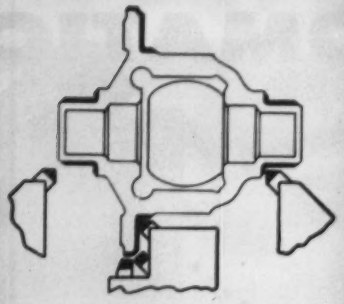
FIRM_____

ADDRESS_____



Heavy lines show the surfaces machined.

Style 112-C Ex-Cell-O Precision Boring Machine with double set-up.

Close-up of the two differential cases, in work position. This precision work is done with hydraulic feeds and easily-controlled automatic cycles.

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with DOUBLED PRODUCTION on Ex-Cell-O STANDARD MACHINES

THE MACHINE TOOL SHOW

XLO
EX-CELL-O for PRECISION

A NEW APPROACH . . . Turn four diameters—face three shoulders—chamfer one edge. Not one at a time—but *Two!* Not on a double end—but on a single end Ex-Cell-O Precision Boring Machine!

Workpieces are automotive differential cases—precision work—limits of plus or minus .0005" on diameters.

See how Precision Boring Machines can save time and money for you. Call your local Ex-Cell-O representative, or phone or write Ex-Cell-O for a Precision Boring Catalog.

54-21

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STEEL
The Metalworking Weekly

MAY 30, 1955
Vol. 136 No. 22

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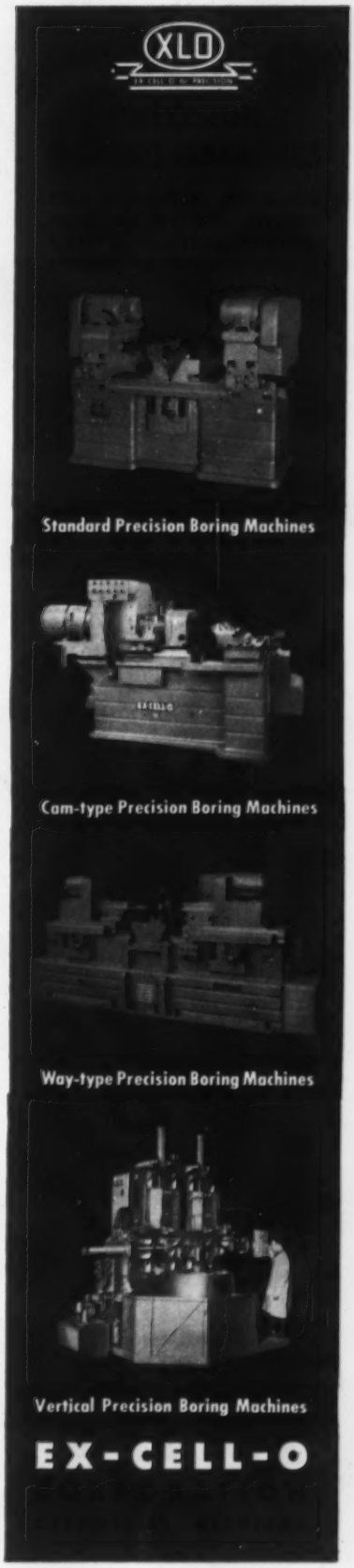

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behind the scenes

Sneak Report

Early one morning last week, 18 of STEEL's managing, associate and assistant editors assembled in solemn conclave to consider the effective construction of short stories. This meeting was one of a continuing series devoted to editorial improvement. Its theme was the care and feeding of pithy paragraphs, and we were invited to sit in as an observer.

Managing Editor Walt Campbell presided, and when we slunk in, the meeting was well under way. Copy Editor Harry Chandler was saying something about an old gentleman who had lived in Denver more than 90 years because he had developed the habit of breathing. This apparently illustrated a point Harry was trying to make, because it was well received. A moment later the speaker related an office adventure with an executive who signed checks with one hand, juggled castor oil bottles with another, spoke into two telephones simultaneously and closed business deals with visitors all the while he was being interviewed. This established the metalworking executive as a busy man who has no time to waste. The stories he reads, Chandler explained, have to be brief.

Assistant Editor Austin Brant elaborated on this theme by suggesting that technical writers should get to the point quickly. He said it was routine to sail into a 15-page article and pare it down to three paragraphs, and yet keep all the pertinent points.

Market Editor Bill Rooney rose to remark that pithy paragraphs were all right in their place. "Who," he inquired, "could cover a convention in one or two paragraphs?" We didn't take sides (we're too windy to be objective), but the thought occurred that a general named Caesar reported an entire military campaign in three words: ***Veni, vidi, vici.***

Honest Frank Briggs, who has been writing for STEEL many years, injected some excitement into the gathering by illustrating his points. One of his sketches, in only two revealing lines, snapped his associates to attention because it suggested the form of an undraped lady en profile, which is French for in profile. The lady's curves, alow and aloft, confirmed Frank's observation that *conciseness* could be obtained with a minimum of lines—or words.

Campbell explained that the use of short items was a matter of editorial judgment, but the fact they were brief was no reason to deny them less than full editorial attention. "You can't polish up the longer stories, and let the shorter ones shift for themselves," he said. He added that the panel speakers, Chandler, Brant and Briggs, had given excellent justification to the short paragraph deal, demonstrating by exhibition and analysis that proper condensation was a distinct service to the reader.

We were rather amazed at the earnestness of the group. You would think offhand that the professional men and women who edit STEEL, or any other business paper, for that matter, would not be inclined to pay too much attention to a rehash of journalistic fundamentals. This gang, however, kicked the gong around with considerable spirit—and the next time you carefully examine short paragraphs in STEEL you will observe that they are all meat and no fat, thanks to professionals instructing professionals.

We Pass to Pascagoula

C. Leonard Forbes, A. R. Wilfley & Sons Inc., Denver, was the only man to get the matched equation. (Pick up one match from the "equal" sign and place it above the "minus" sign. The equation then becomes "one equals three, minus two".)

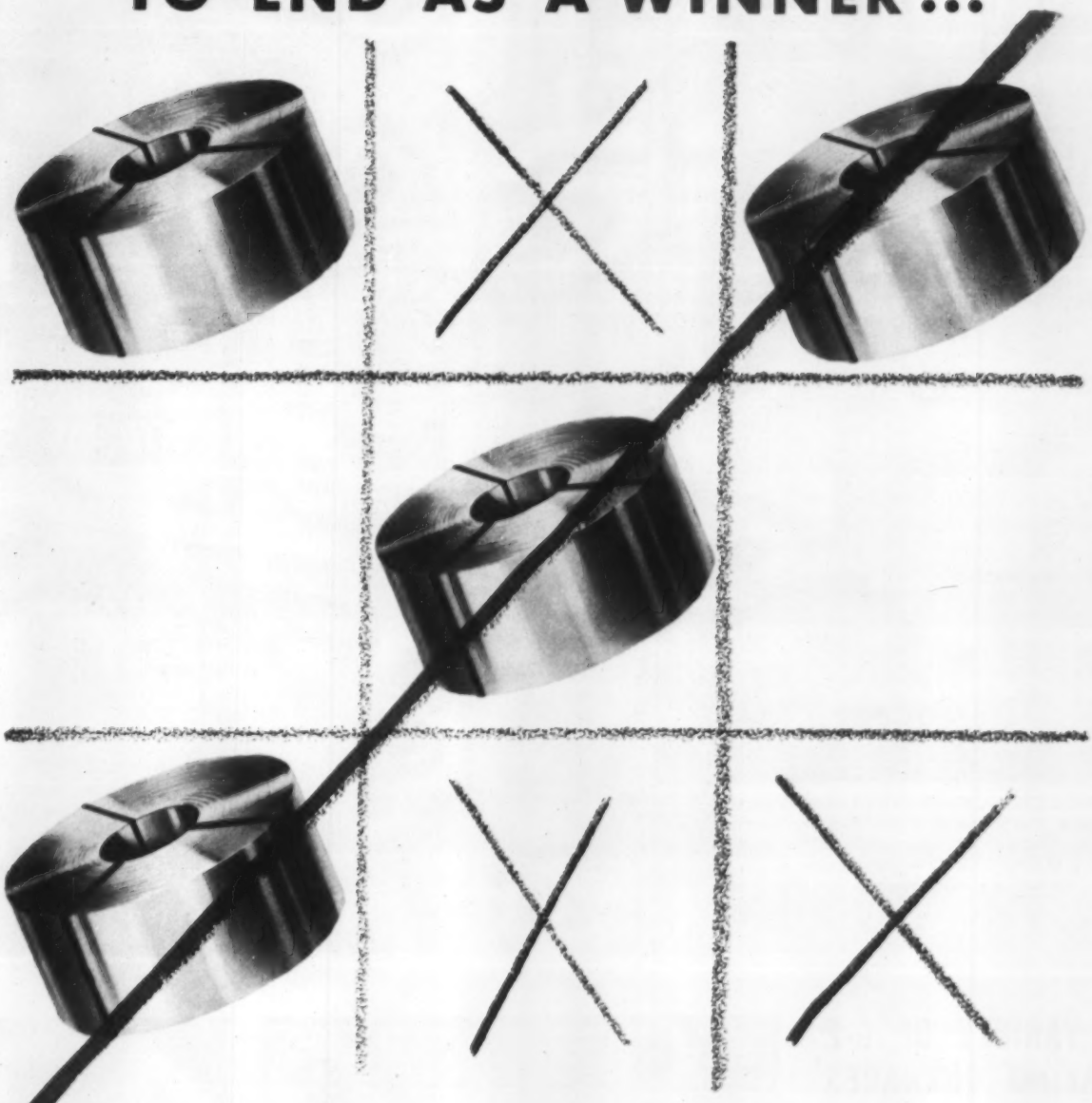
L. G. Weber, material controller, the Ingalls Shipbuilding Corp., Pascagoula, Miss., was kind enough to offer us this problem: "What is the smallest number," inquires Mr. Weber, "equally divisible by 13, which, when divided by 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12, leaves a remainder of 1?"

Thank you, sir, for supplying us with the answer, too.

Shrdlu

(Metalworking Outlook—Page 29)

TO END AS A WINNER...



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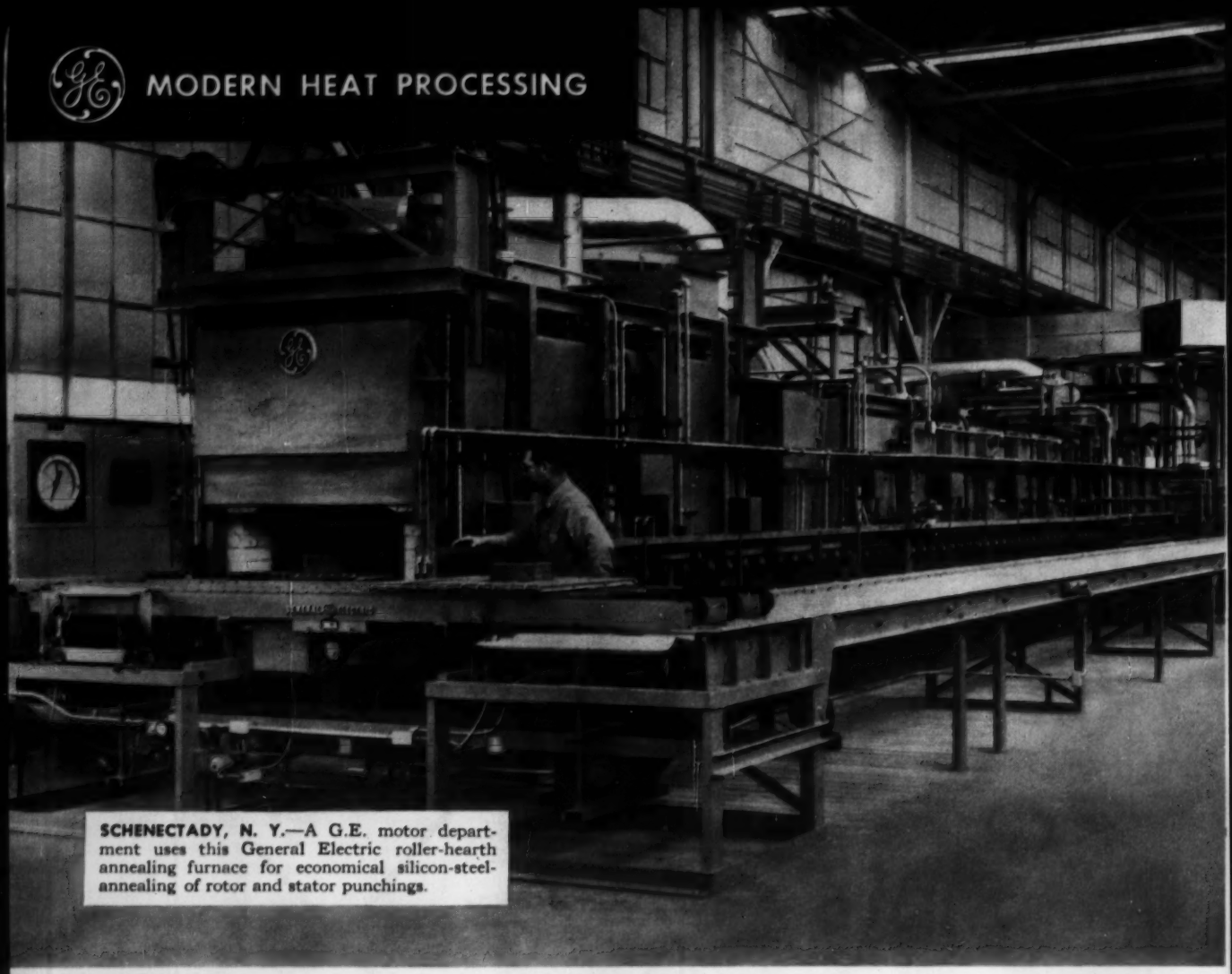
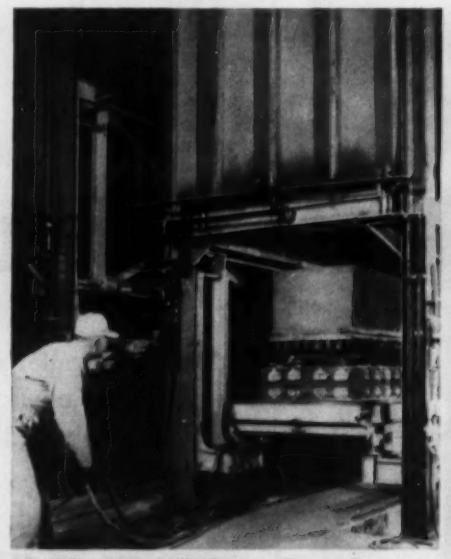
MODERN HEAT PROCESSING



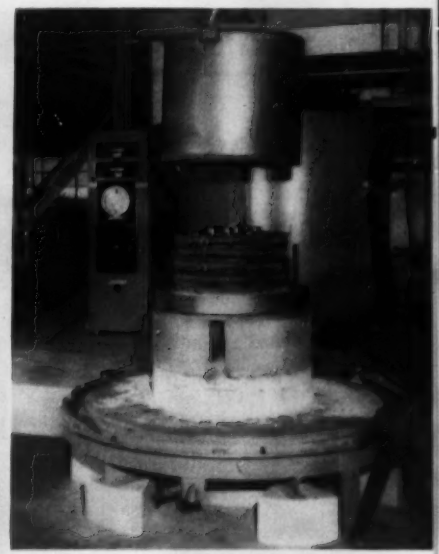
SCHENECTADY, N. Y.—A G.E. motor department uses this General Electric roller-hearth annealing furnace for economical silicon-steel-annealing of rotor and stator punchings.

WIDE VARIETY OF G-E ANNEALING FURNACES NOW LETS YOU ANNEAL SILICON STEEL RIGHT IN YOUR OWN PLANT

Take a tip from General Electric, user of about 25% of the country's production of silicon steel—you can cut costs by annealing your own silicon steel. There's a General Electric silicon steel annealing furnace for nearly every type of annealing application—large or small. For example, the furnaces at right are located in different G.E. plants, each handling a different size silicon-steel-annealing job—*economically*.



G-E ELEVATOR FURNACE at Rome, Ga. plant is used for high temperature annealing of transformer cores—furnace fits in minimum space.



G-E BELL FURNACE, Waynesboro, Va. Low-production unit anneals machine parts at low cost.

PROBLEM:

Annealing silicon steel in an automated setup

SOLUTION:

G-E roller hearth furnace anneals stator punchings and weld in one pass, cuts costs

A roller hearth furnace in the new automated production line for one of G.E.'s motor departments anneals 1500 pounds of rotor and stator punchings an hour—helps produce a Tri-Clad* 55 motor (7½ to 35 hp) every 2½ minutes. The stator punchings and weld are annealed at the same time. This eliminates the cost and time involved in making two passes through the furnace. Only one man is needed to oversee the complete annealing operation.

IN ADDITION TO G-E furnace quality, here are the advantages you receive when you deal with G.E. on silicon steel annealing:

(1) TECHNICAL KNOWLEDGE—G-E research helped pioneer the development of silicon steel for improved magnetic properties.

(2) EXPERIENCED USER—G.E. uses about 25% of the total production of silicon steel.

(3) EXPERIENCED BUILDER—G.E. offers a complete line of furnace and control equipment for your silicon steel annealing.

(4) APPLICATION HELP—plus installation supervision—assure you of the most efficient furnace installation.

(5) MAINTENANCE SERVICE—Nearly 200 G-E service shops, located throughout the country, are ready to help you 24 hours a day.

ASK FOR THE SERVICES of your local G-E Apparatus Sales Representative in assessing the economies of annealing silicon steel in your plant. Just call your nearby General Electric Apparatus Sales Office.

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GENERAL ELECTRIC

G-E MESH-BELT FURNACE located at Ft. Wayne, Ind. plant blue-anneals rotor laminations. Ideal for medium production, the mesh-belt furnace is flexible for use over a wide range of temperatures and speed.

FREE PROCESS BULLETINS

Please send me the Modern Heat Processing bulletins I have checked below.

- ☐ Protective Atmospheres, GEA-5907
- ☐ Annealing Malleable Iron, GEA-5797
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- ☐ Wire Enameling, GEA-6179
- ☐ Heat-treating Aluminum, GEA-5912
- ☐ Forging with Induction Heat, GEA-5983

General Electric Company
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When you buy Udylite barrel plating cylinders you get more than good materials—you get the experienced engineering that has made Udylite barrels the best built, longest lasting, most economical barrels on the market. For Udylite barrels are constructed with the characteristics of the materials well in mind—and engineered accordingly.

Along with fine engineering Udylite is in continuous search for materials giving longer life and greater over-all economies in barrel plating. Udylite manufactures barrels of Rubber, Bakelite, Melamine, Lucite and now in turn has developed Tempron Hard Rubber.

Tempron Hard Rubber is recommended as the best plating barrel cylinder material now available, but its characteristics require special construction. Udylite's new construction (patent pending) features interlocking panels and ribs with the added advantage that panels, ribs, rails and cylinder heads are individually replaceable.

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DETROIT 11, MICHIGAN

LETTERS
TO THE EDITORS

Interchange of Thoughts

I have just finished reading your article, "Business Communication: Put It on Executive-Saving Time" (May 16, page 103). It is one of the finest articles on the subject it has been my privilege to read.

R. F. Van Wickle
Engineering Department
Stoddart Aircraft Radio Co. Inc.
Hollywood, Calif.

I find it interesting and full of helpful suggestions.

H. C. Hoover
Works Manager
Continental Foundry & Machine Co.
Coraopolis, Pa.

Sorry, You're Mistaken

While visiting a steel machinery producing company, I read a magazine article dealing with the break-even point of steel producing companies. I recall it being 35 to 45 per cent. I mentioned this to an associate and he scoffed.

I cannot locate the article since I do not remember the magazine's name. Can you supply the average break-even point or direct me to a source that can?

Joseph Captain
176 Second Ave.
New York

• *The steel industry break-even point varies from company to company and from day to day. An accurate determination of the break-even point is impossible. For "guesstimates," we are sending you tear sheets of "Steel's Break-Even Point—60%?" (Apr. 26, 1954, page 59) and "Old Question: New Answer," an item in the Metalworking Outlook column of Nov. 8, 1954 (page 37). They give the break-even point at 60 per cent, or a possible 70 per cent of capacity.*

Author Commended

We wish to commend Fred L. Spangler of Leeds & Northrup Co., Philadelphia, for a fine article on steam heat treating in your May 9 issue (page 82).

Anthony J. Zino Jr.
Sales Manager
Dixon Sintaloy Inc.
Stamford, Conn.

Job Shop Advocate

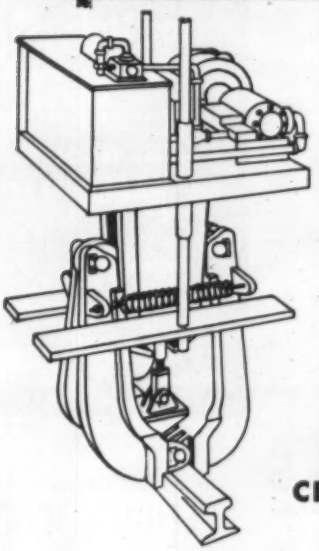
Since I have given thought to the make-or-buy question, your article, "Job Shops: Six Paths to Profit" (May 2, page 73) is of special interest to me.

From the standpoint of cost economy, I believe a business firm should not undertake as a side line any productive operation that can be performed successfully by an outside supplier who

(Please turn to page 12)

the utmost
SAFETY

in the Operation of ORE and COAL BRIDGES Makes HEYL & PATTERSON Hydraulic Rail Clamps and Hydraulic Buffers a MUST!



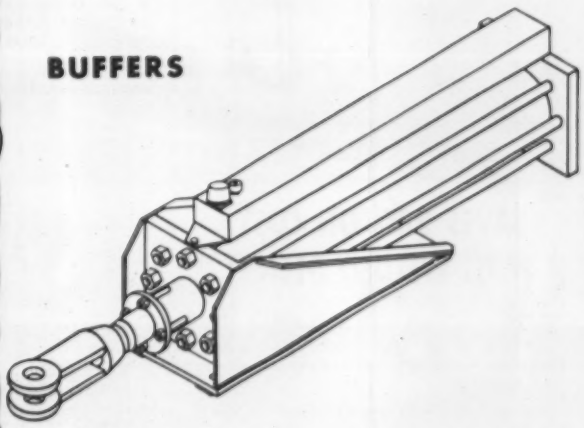
RAIL CLAMPS

If a coal or ore bridge moves due to wind or over-skews due to electrical or human failure, then safety of men and equipment depends on the rail clamps. They are designed to set automatically in case of interruption of power due to over-skew or high wind.

H & P hydraulic rail clamps afford a positive holding force on runway rails. Clamp setting time can be adjusted between 2 and 10 seconds, and units in sizes up to 75 tons each can be furnished.

Heyl & Patterson hydraulic rail clamps are available in suitable sizes to protect new or old structures.

BUFFERS

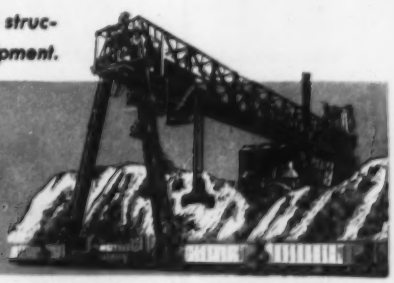


If the trolley is headed for the end of the runway, and control is lost because of electrical or mechanical failure, ice on rails, or operator incapacity, safety of men and equipment depends on the buffer. H & P hydraulic buffers afford positive controlled deceleration when all else fails.

Because this buffer is pull-type, the piston is fully protected when not in use, and a minimum of maintenance is required. A latching device on the trolley resets the H & P buffer assembly automatically.

Heyl & Patterson hydraulic buffers are available in 2, 4, and 6 foot travel for both old and new installations.

Heyl & Patterson's 50 years of experience with movable structures can help you increase the safety of your equipment.



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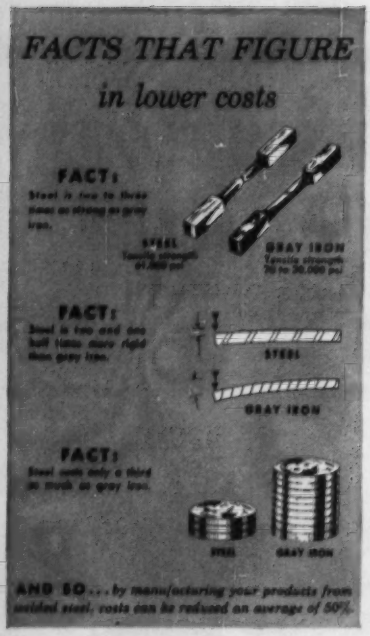
55 FORT PITT BLVD. PITTSBURGH 22, PA. PHONE COurt 1-0750



SAVES 38% ON COST WITH WELDED DESIGN

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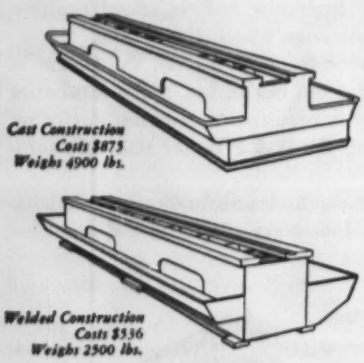
Savings of $339 are realized on this machine base by changing over from cast iron to welded steel construction. Even though 2400 fewer pounds of metal are used, the steel base is actually 40% more rigid to resist deflection under load. Result: Greater accuracy of alignment . . . at lower cost of manufacture.



Cast Construction
Costs $875
Weighs 4900 lbs.

Welded Construction
Costs $536
Weighs 2500 lbs.

PUT THESE BENEFITS TO WORK—Ideas on designing for low cost with steel are in Lincoln WELDesign Bulletins, available to designers and engineers. Write:

THE LINCOLN ELECTRIC COMPANY
Dept. 1605, Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment

LETTERS

(Concluded from page 10)

utilizes his full time, energy and know-how in supplying the same type of product or service.

From the standpoint of the economy as a whole, I feel it is unfortunate for a company to undertake self-service to save a few pennies, when, at the same time, an independent supplier can produce it for approximately the same price and have a substantial profit margin.

I realize any attempt to sell this idea to industry may be "doing it the hard way," but I feel a fundamental approach is likely to be the superior one. Perhaps a good means of approach would be through the trade associations.

Dr. Robert L. Dixon
Professor of Accounting
University of Michigan
Ann Arbor, Mich.

● *Dr. Dixon has explored the problem further in his article, "Creep," in the July, 1953, issue of* The Journal of Accountancy.

Matchless Heating

Your article, "Which Frequency Do You Choose?" (May 2, page 126), gives no reference to the kilowatt-hours required to bring 50 lb of steel to 2300° F. Could you supply me with this information?

L. W. Cole
Chairman
Federal Pacific Electric Co.
Newark, N. J.

● *It depends on the diameter of the billet being heated, according to Magnethermic Corp., P. O. Box H, Youngstown 7, O. We suggest you write to them.*

Guide of Quality

Thank you for tear sheets of the article, "Steel Buying by Statistics" (Apr. 18, page 104). This spelling out of Ternstedt's experience in terms of requirements will serve as a guide of quality for those of us who have not made statistical studies relating properties with performance. Articles of this type are of real service.

E. R. Babylon
Sales Metallurgist
Kaiser Steel Corp.
Oakland, Calif.

Corrosion Prediction

We would like more information about an item in the Technical Outlook column of May 9 (page 77). It says electrical measurements in the laboratory can predict corrosion rates of bolts used in underground structures.

F. G. Gegner
Iowa Valve Co.
Oskaloosa, Iowa

● *See the article, "Electrical Measurements in the Selection of Bolt Materials for Service Underground," in the* Journal of Research *(National Bureau of Standards), Vol. 52 (1954), page 5.*

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Immediate Delivery from Stock

STRIP · Flat Wire and other Stainless Steels

a foot or a pound and up
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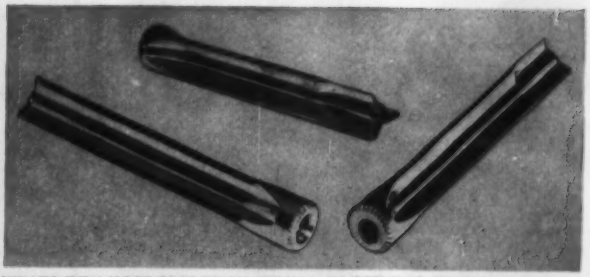
Stamco has equipment available in a wide range of sizes and speeds for coiling and sheeting applications in mill, warehouse or factory. These bulletins tell the complete story. Request them by number on your letterhead. No obligation.

STAMCO, Inc., New Bremen, Ohio

WIDE ENDURO BELT ...keeps scratches off bandages

CORROSION RESISTANCE IN TUBULAR FORM. Republic's Steel and Tubes Division turns out miles of ENDURO Stainless Steel Tubing for the process industries and for mechanical applications. Republic ELECTRUNITE Stainless Steel Tubing and Pipe offer the identical high mechanical and corrosion-resisting properties demonstrated in sheet form by the Reynolon belt. Call Steel and Tubes for application assistance on all your fluid handling and tubing problems.



WHAT'S EVEN MORE CORROSION-RESISTANT? REPUBLIC TITANIUM. Titanium surpasses even stainless steel in resistance to many severe forms of corrosion. Yet, it weighs only 56% as much as alloy steel. Here, Republic Titanium supplies corrosion-resistance and lighter weight to parts designed to knit human bones. Republic Titanium and Titanium alloys now are available for civilian applications. Republic has the experience to help you use them best. Write us.

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Cleveland 27, Ohio

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- ☐ Stainless Metallurgical Assistance
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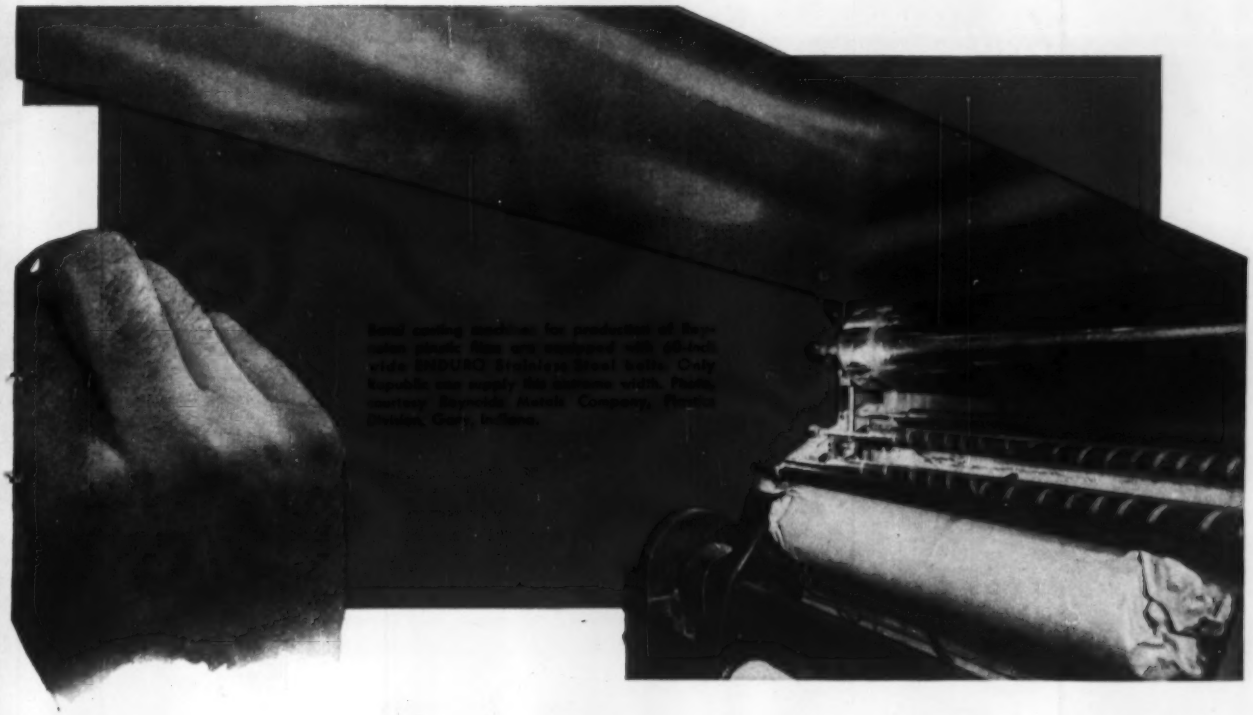

This wide, polished ENDURO Stainless Steel belt carries Reynolon plastic coatings in process. One such type makes the peel-off backing for those handy packaged small bandages you use.

The ENDURO surface provides a high luster finish! Since the slightest scratch would be "mirrored" or duplicated in the finished product, the quality of the stainless steel surface determines the quality of the plastic coating. Here, ENDURO keeps scratches off bandages!

Note that the belt is supported only by top rollers. That allows both sides to carry the plastic material . . . speeds production. It also means that the belt must have great tensile strength. ENDURO supplies that strength. In this case, tension on the belt runs as high as 90 tons.

What's more, this belt must be heat-resistant. In process, material passes through 600° ovens. And, many of the plastics processed are in hydrous or acidic solutions. So, the belt must resist rust and corrosion. ENDURO does just that.

Four of these sixty-inch wide belts help produce Reynolon plastic film. Even at this extreme width, the belts must stay flat. "Crowned" metal could snap like an oil can and damage the plastic.

Republic metallurgists worked closely with Reynolds Metals Company, Plastics Division, to develop this unusual equipment. If you have process or product problems involving heat, corrosion, surface finish or strength, ENDURO Stainless Steel quite likely is your answer. Republic metallurgists will help you apply it most profitably. Write Republic.

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World's Widest Range of Standard Steels and Steel Products

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COLORFUL FUNCTIONAL DESIGN

The new Victor No. 10 and No. 15 frames fit either 10-inch or 12-inch blades, yet are built around a solid, one-piece steel backbone, the most rigid construction ever devised. New under-the-handle lever-lock automatically — instantly — puts correct tension on every blade. Colorful molded Tenite handles appeal to eye and hand.

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Red handle — smooth high-gloss rustproof finish. Complete with 12-inch Victor "Moly" High Speed Blade

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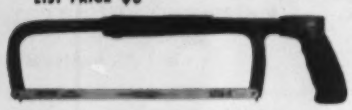

Long-time mechanics' favorite. Adjustable for 10-inch or 12-inch blades. Extra-leverage tension lock.

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A composite view of The New Britain Machine Company's six plants in New Britain, Connecticut; Springfield, Massachusetts; Cleveland, Ohio; and Dayton, Ohio . . . built on a foundation of sixty years of service to the world's metalworking industries. Its machine tool divisions produce: ➡

- **Automatic Bar Machines**
- **Automatic Chucking Machines**
- **Precision Boring Machines**
- **New Britain +GF+ Copying Lathes**
- **Lucas Precision Horizontal Boring, Drilling and Milling Machines**
- **Special Automatic Metalworking Machines**

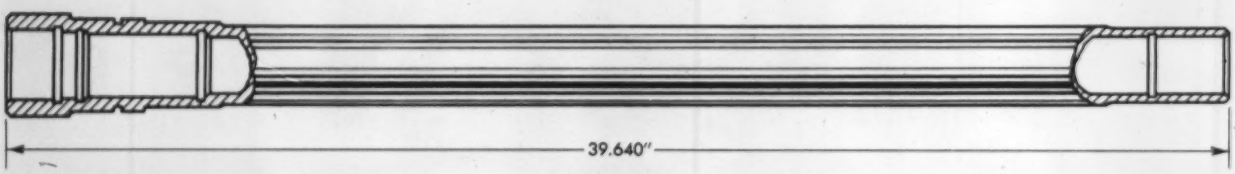
For news of New Britain developments that could improve *your* production methods, see the four following pages.

See it in operation

Ask your New Britain representative for a showing of the color motion picture "A NEW APPROACH TO COPY TURNING." Or write The New Britain Machine Company, New Britain, Connecticut.

This is New Britain's approach to copy turning

Can you find profit opportunities in *your* shop with this new approach? Let your New Britain man help you . . . that's his business.



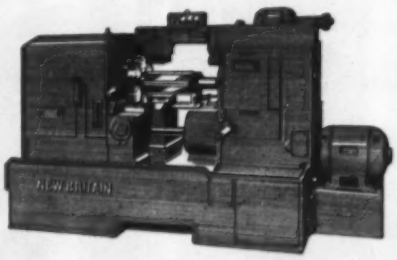
Saves $10 per piece and $3,000 worth of gauges plus labor and overhead on two machines

These are the five operations which formerly required four separate set-ups on three different machines: (1) Rough turn three Outside Diameters, (2) rough turn four Outside Diameters, (3) face large end, center, bore three Inside Diameters, undercut and chamfer three surfaces, (4) face end to length, bore center and undercut, (5) finish turn six Outside Diameters, undercut, form radii and chamfer — all this machining is done in five operations on one New Britain +GF+ Copying Lathe.

New Britains are "naturals" for work like this

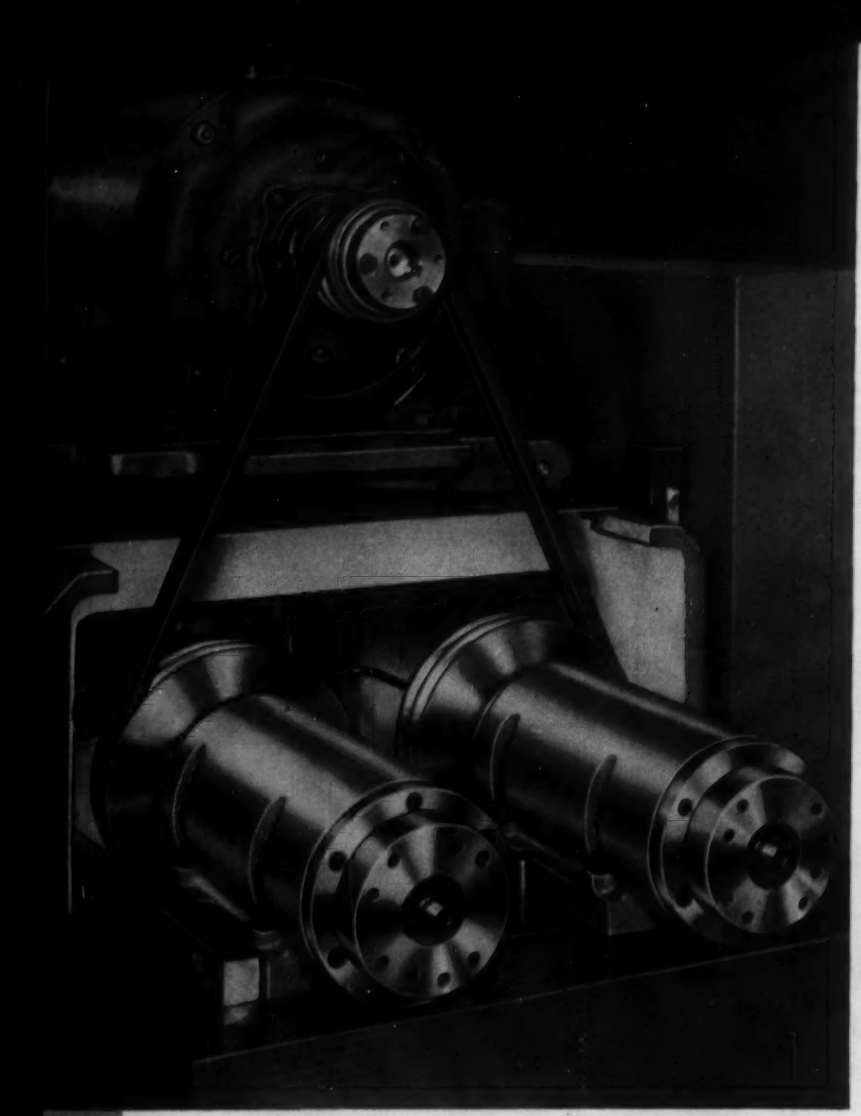
New Britain alone makes *both* tool rotating

and



work rotating chucking machines, to provide the best approach to economical production of your work.

The two preceding pages and two following present other New Britain *New's*.



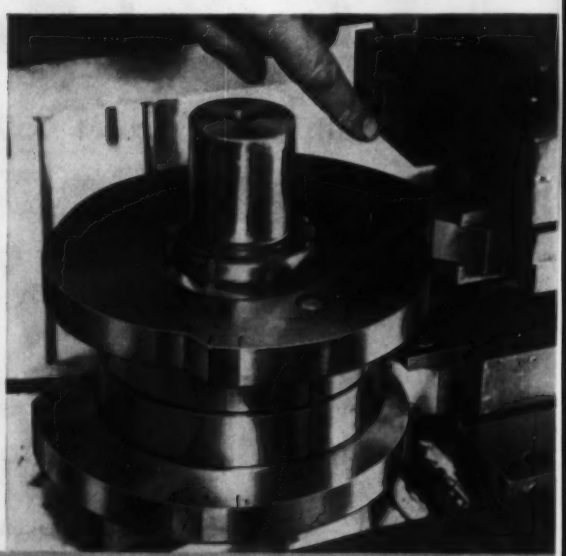
Spindle accuracy is the first essential to holding close tolerances on a boring machine. To utilize this accuracy New Britain spindles are mounted on a stationary bridge securely bolted to the rigid frame of the machine. Drive motor is mounted on a separate bridge above the spindles . . . table is not affected by motor heat and vibration.

Secret of permanent boring machine accuracy:

Pinpoint control protected by the mass of the machine

A true running cam shaft preserves the accuracy of the tool path. Easily accessible precision cams are mounted on a shaft, straddle mounted directly to the frame of the machine (top bearing bracket has been removed in this photo). Top and bottom cam shaft bearings are a minimum distance from the cam. The shaft keeps its accuracy because of this rigid mounting, and also because the thrust from both cam followers is in one direction.

New Britain Precision Boring Machines have provided a new approach to the fast production of problem pieces in America's leading high output plants. Ask your New Britain man or write The New Britain Machine Co., New Britain, Conn., for the book, "24 COST CUTTING JOBS."



This is an easy job for a Lucas

LUCAS
CLEVELAND

This twenty-foot weldment requires a combination of milling, boring and key slotting, all of which are performed in one setting. Backrest was removed from the machine, and the work is supported on an auxiliary table. *(Photo courtesy Steel Equipment Co., Cleveland, O.)*

This awkward work piece is another demonstration of Lucas flexibility. A LUCAS PRECISION HORIZONTAL BORING, DRILLING AND MILLING MACHINE does a wide range of work easily, accurately and inexpensively. You have ruggedness, accuracy and flexibility of work handling that you can count on.

Automatic power positioning enables you to positively repeat operations on any number of pieces. New ultra-simple pendant control is always at the operator's fingertips. Let your Lucas representative show you how far your machine-tool dollar can go, invested in this most versatile machine in any shop.

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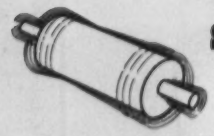
See the preceding four pages for other New Britain New's.

Why GISHOLT BALANCING stresses "plane separation"



Take this typical part: when you rotate it at high speed, any unbalance effect at one point—or plane—has a "cross effect" in another. If you don't have proper means for separating these unbalance effects in two correction planes, then your balancing job becomes a tedious, time-wasting job of trial and error. And you're never quite sure.

Gisholt Balancers provide plane separation by means of electrical networks. They enable you to use whatever correction planes are most convenient on your specific parts. They let you measure unbalance directly in correction units. They give you the most sensitive, accurate means ever devised—capable of measuring vibratory movement of at least .000025 inch. Gisholts are faster, easier to operate, easier to read. And they make it easy for you to be *sure*.

To have less than these advantages is to add to your costs in other ways—in time, loss of accuracy and inferior balancing standards. Ask us to send the Gisholt Balancing Catalog.

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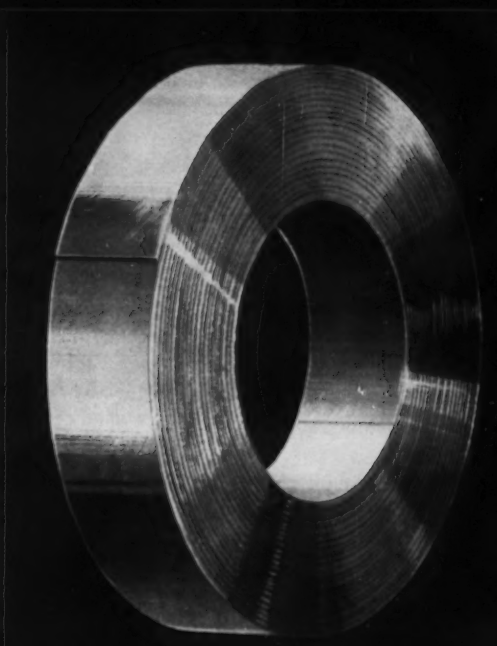

Sentries of Quality

Weirton mills are blanketed with "sentry stations." From these outposts, the quality and uniformity of Weirton steel is guarded and guided by constant control.

From stations located throughout the mills, samples of materials are periodically carried to the Quality Control Laboratory by special pneumatic tubes. Here, complex analysis, checks and tests are made simultaneously by chemists, metallurgists and engineers, who use the most up-to-date equipment. Based on their findings, directions are flashed by telautograph and two-way radio to the men on the job.

This network of fast-acting controls is one more way Weirton maintains strict high quality and uniformity of its cold-rolled strip steel, along with the many other types of steel it makes. It is one more important reason why you should call Weirton the next time your plans call for cold-rolled strip steel.

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Weirton, West Virginia

NATIONAL STEEL CORPORATION

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Power springs for watches, instruments, office machines and other industrial uses.

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- **With square, round or dressed edges.**
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Ask your nearest Sandvik office for further information or technical assistance.

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SANDVIK CANADIAN LTD., P.O. Drawer 430, Station O, Montreal 9, P.Q.

CALENDAR
OF MEETINGS

May 30-June 1, National Association of Purchasing Agents: Annual meeting and exhibit, Waldorf-Astoria hotel, New York. Association's address: 11 Park Place, New York 7, N. Y. Secretary: G. A. Renard.

May 30-June 10, Canadian International Trade Fair: Exhibition Park, Toronto. Information: Director of the Trade Fair, Exhibition Park, Toronto, Ont., Canada.

May 31-June 1, National Rivers & Harbors Congress: National convention, Mayflower hotel, Washington. Congress' address: 1720 M St. N.W., Washington 6, D. C. Executive vice president: William H. Webb.

May 31-June 3, Basic Materials Exposition: Convention Hall, Philadelphia. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

June 2-4, Electric Metal Makers Guild Inc.: Annual meeting, Hotel Fort Shelby, Detroit. Information: A. C. Ogan, secretary, Box 6026, Mt. Washington Station, Pittsburgh 11, Pa.

June 2-4, Steel Kitchen Cabinet Manufacturers Association: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

June 5-8, American Gear Manufacturers Association: Annual meeting, the Homestead, Hot Springs, Va. Association's address: 1 Thomas Circle, Washington 5, D. C. Secretary: John C. Sears.

June 5-9, American Society of Mechanical Engineers: Annual oil and gas power conference, Hotel Statler, Washington. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 6-9, National Industrial Service Association Inc.: Annual convention and exhibit, Hotel Statler, Los Angeles. Association's address: 818 Olive St., St. Louis 1, Mo. Secretary: Fred B. Wipperman.

June 7-10, American Welding Society: National spring meeting and exposition, Municipal Auditorium, Kansas City, Mo. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: J. G. Magrath.

June 12-17, Society of Automotive Engineers Inc.: Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

June 13-17, Technical Writers' Institute: Rensselaer Polytechnic Institute, Troy, N. Y. Information: Jay R. Gould, director, Technical Writers' Institute, Rensselaer Polytechnic Institute, Troy, N. Y.

June 13-17, American Society of Civil Engineers: Spring meeting, Jefferson hotel, St. Louis. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: Col. Wm. N. Carey.

June 13-17, National Association of Power Engineers Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Association's address: 176 W. Adams St., Chicago, Ill. Secretary: A. F. Thompson.

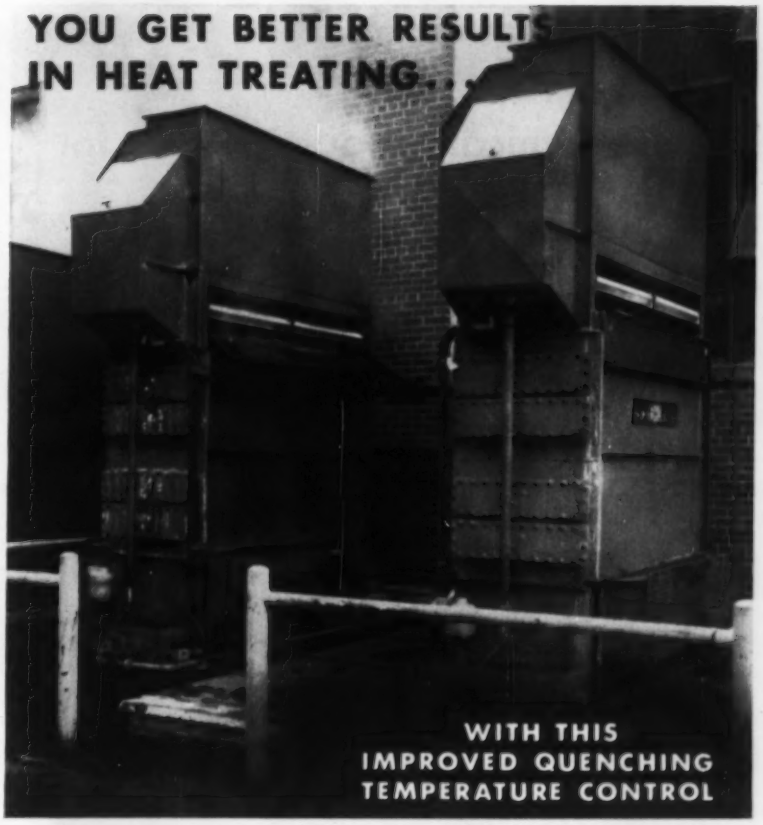
June 14-16, Radio-Electronics-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

June 14-16, American Institute of Electrical Engineers: Magnetics conference and exhibit, William Penn hotel, Pittsburgh. Institute's address: 36 W. 46th St., New York 36, N. Y. Secretary: N. S. Hibshman.

June 15-17, American Marketing Association: National conference, Schroeder hotel, Milwaukee. Association's address: David Kinley Hall, University of Illinois, Urbana, Ill. Secretary: Harvey W. Huegy.

June 15-17, American Society of Training Directors: Annual meeting and exhibit, Los Angeles. Society's address: 2020 University Ave., Madison 5, Wis. Secretary: Walter H. Kee.

June 16-17, Machinery & Allied Products Institute: Annual meeting, Hotel Statler, Washington. Institute's address: 1200 18th St. N.W., Washington 6, D. C. Secretary: Charles W. Stewart.



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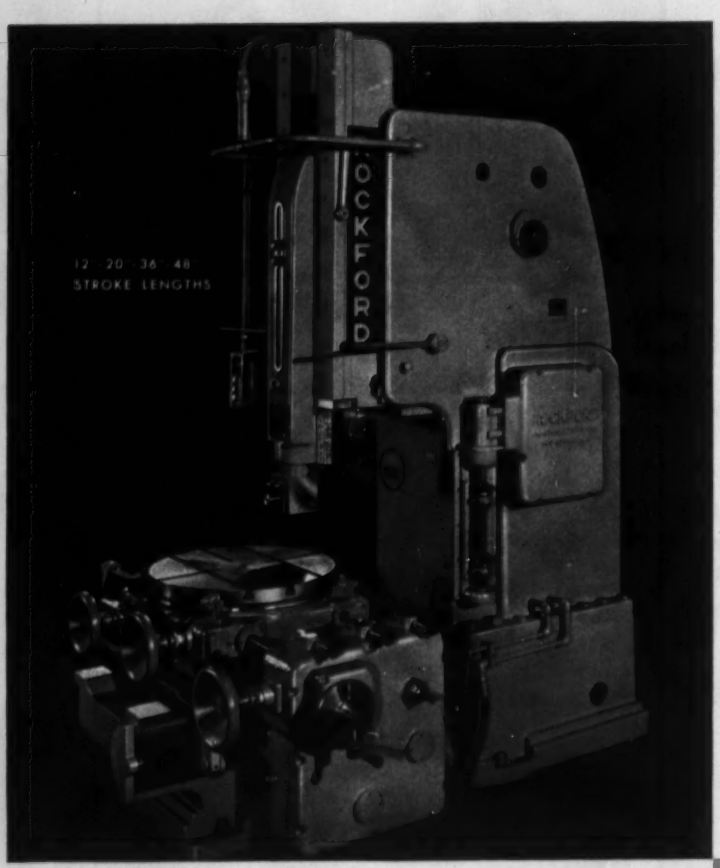

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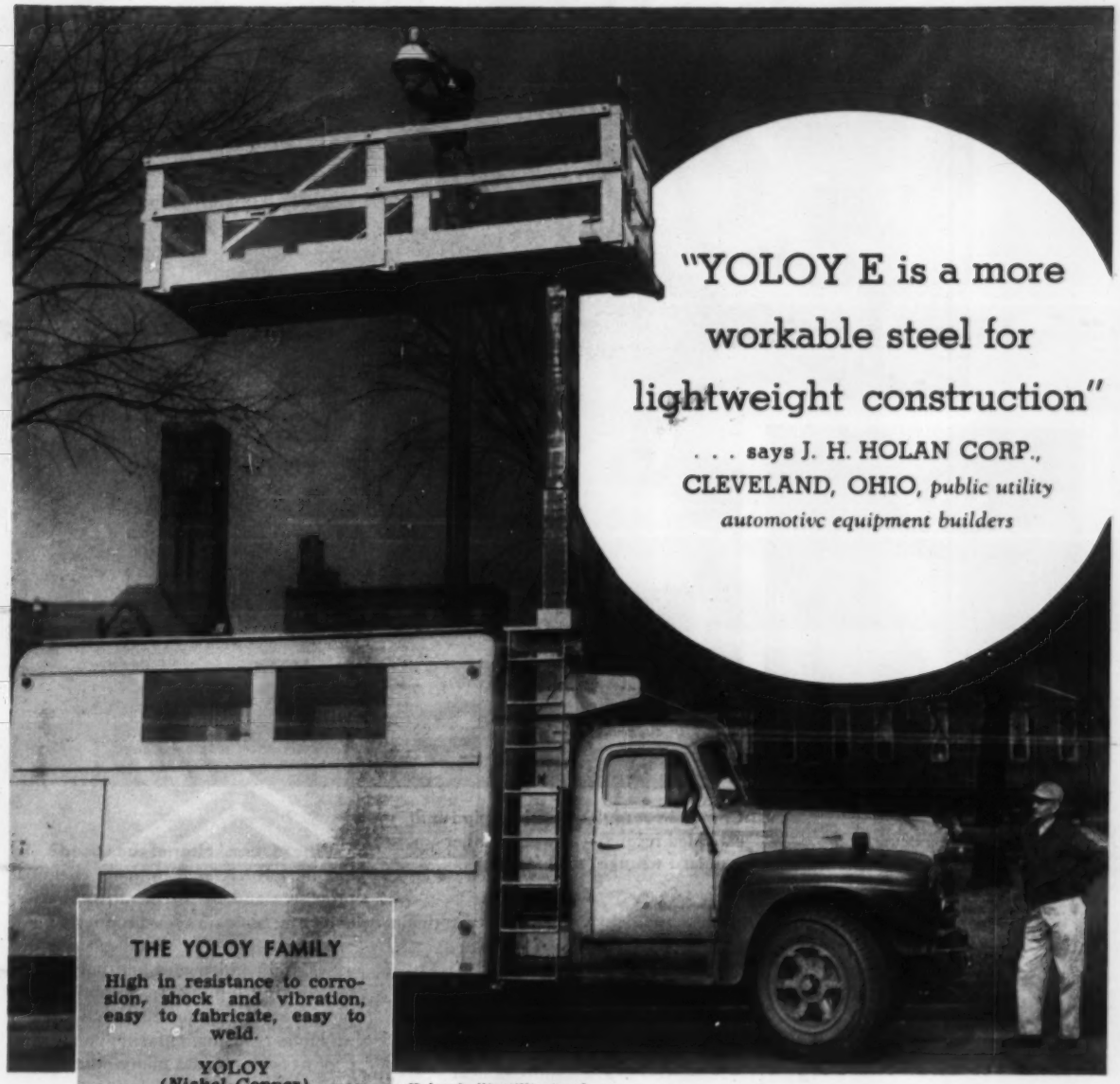

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High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

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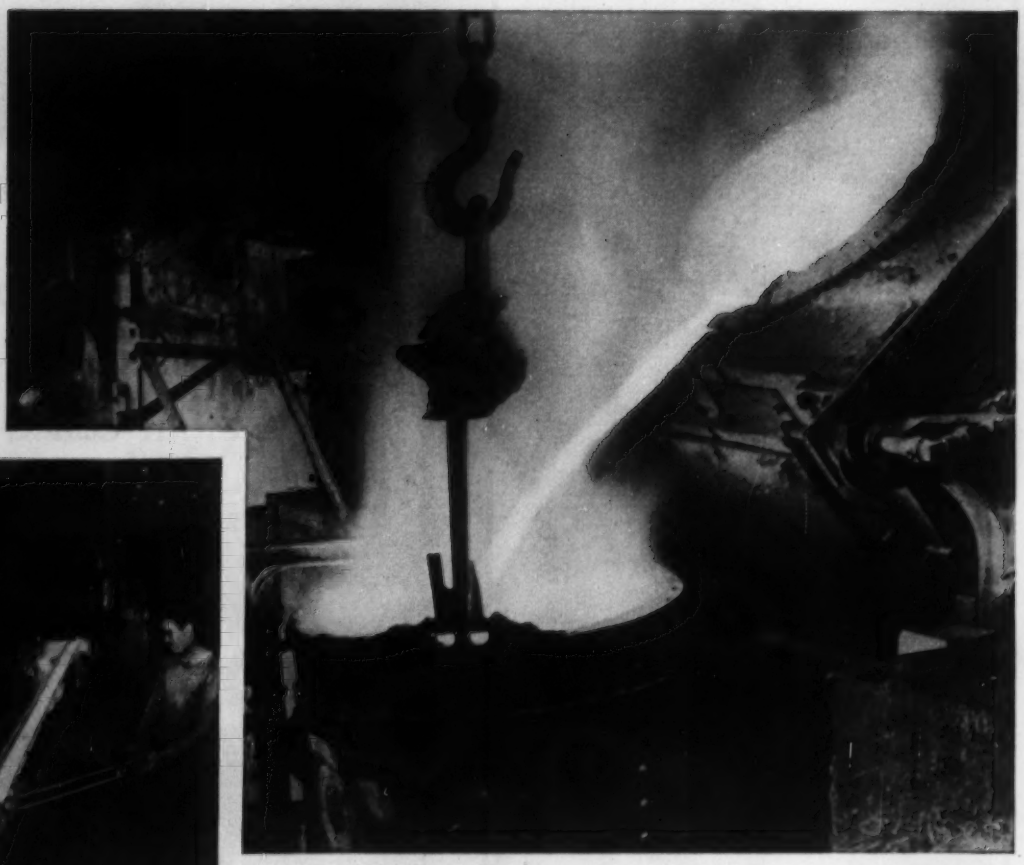

Comes in seamless tubing, pipe and extruded tubing — as well as other standard wrought mill forms.

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New Inco Nickel Alloy to withstand hot acids and oxidizing chemicals

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Have you heard about Nionel?

It's Inco's new nickel-chromium alloy, containing molybdenum and copper, designed to withstand corrosive conditions of unusual severity.

Nionel brings you outstanding resistance to certain hot acids — sulfuric, sulfurous, nitric and phosphoric acids. It resists such oxidizing chemicals as nitrates and cupric, ferric and mercuric salts (except chlorides). It is highly resistant to most organic acids as well as to general corrosion, pitting and stress-corrosion cracking by sea water and other chloride-containing waters.

Where can Nionel be used? To handle sulfuric acid in many chemical processes and in petroleum refineries, detergent plants, rayon production and ore treatment. To handle sulfurous gases and condensates and pulp digester cooking liquors. In equipment for phosphoric acid production. In heat exchangers using chloride-containing cooling waters. And many other applications.

What forms are available? All standard mill forms, including plate, seamless condenser tubing, pipe and extruded tubing.

In Nionel you have an important new ally in the battle against difficult corrosive conditions. So learn all about it. The new booklet "Introduction to Nionel" describes composition, physical and chemical properties, suggested applications. Write for your free copy.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **Nickel Alloys**

Nionel ... *for strong corrosives*

Metalworking Outlook

UAW Goes It Alone

The United Auto Workers are left virtually alone as champions of the guaranteed annual wage. Six major CIO groups have just about dropped the idea for this year. They are the United Rubber Workers, the Textile Workers Union, the Glass & Ceramic Workers, the International Union of Electrical Workers, the United Steel Workers and the Oil, Chemical & Atomic Workers. The six have a majority of CIO membership. The IUE's 10-cent wage-and-fringe settlement with Radio Corp. of America signaled that union's dropping of GAW.

How Automation Cuts Prices

General Electric Co. cut prices 20 per cent by using printed circuits and other automation devices to produce the ¾ to 3-hp sizes of its Thy-Mo-Trol. The techniques soon will be applied to make all sizes of the unit, an electronic control device which itself is used in automation lines. The extension to all ranges will be possible because of the new GE Specialty Control Division plant at Waynesboro, Va. (page 40). Comments Division General Manager Louis T. Rader: "We can produce them automatically, but we haven't developed a method to get sales automatically."

May Tool Orders To Recover

New orders for machine tools in May should hit about $60 million. The totals probably will slip in the summer months, but recover in the fall. April new orders slipped to $53,450,000, down $10 million from the previous month's level but still 26.5 per cent better than April, 1954. The industry generally is not alarmed by the April showing. "It's a mere ripple in the curve," says one executive.

Reynolds May Shift Plant Site

Reynolds Metals Co. will build a new aluminum reduction plant, but maybe not at Sheffield, Ala., its original choice for a site. Tax legislation now under discussion in the state is causing Reynolds to reconsider its decision about the location. But the plant will be built. It will have an annual capacity of 50 million lb.

Where Expansions Come

The major industrial expansions are coming in Ohio, Indiana, Illinois, Michigan and Wisconsin. A Commerce department survey reveals that those states from Jan. 1, 1950, to Dec. 31, 1954, had 5126 projects costing $4.6 billion certified for fast writeoff. That's more projects and greater costs

Technical Outlook—p. 69 Market Outlook—p. 93

than in any other area. Closest competitors were New York, New Jersey and Pennsylvania which had certified 3676 projects costing $4 billion.

Accent on Aircraft

The emphasis on airpower changes the ranking of military contractors. The first 11 of the top 100 which got new orders from the Pentagon from July 1, 1953, to Dec. 31, 1954, are all aircraft companies. Only two auto firms, Ford Motor Co. and American Motors Corp., remain on the list, Ford ranking 33 and AM 91. General Motors Corp. and Chrysler Corp. aren't even on it because of heavy contract cancellations. GM is still the biggest defense contractor on a cumulative basis.

Just for the Record

Don't expect too much out of a new Pentagon directive that the Army and Navy justify the continued operation and maintenance of arsenals, ordnance plants and shipyards. The move comes as a compliance with Hoover Commission recommendations to get the government out of business. But many of the operations are required by statute, and Democratic congressmen oppose the Hoover report, anyway.

Power Mowers Cut Wider Sales Swath

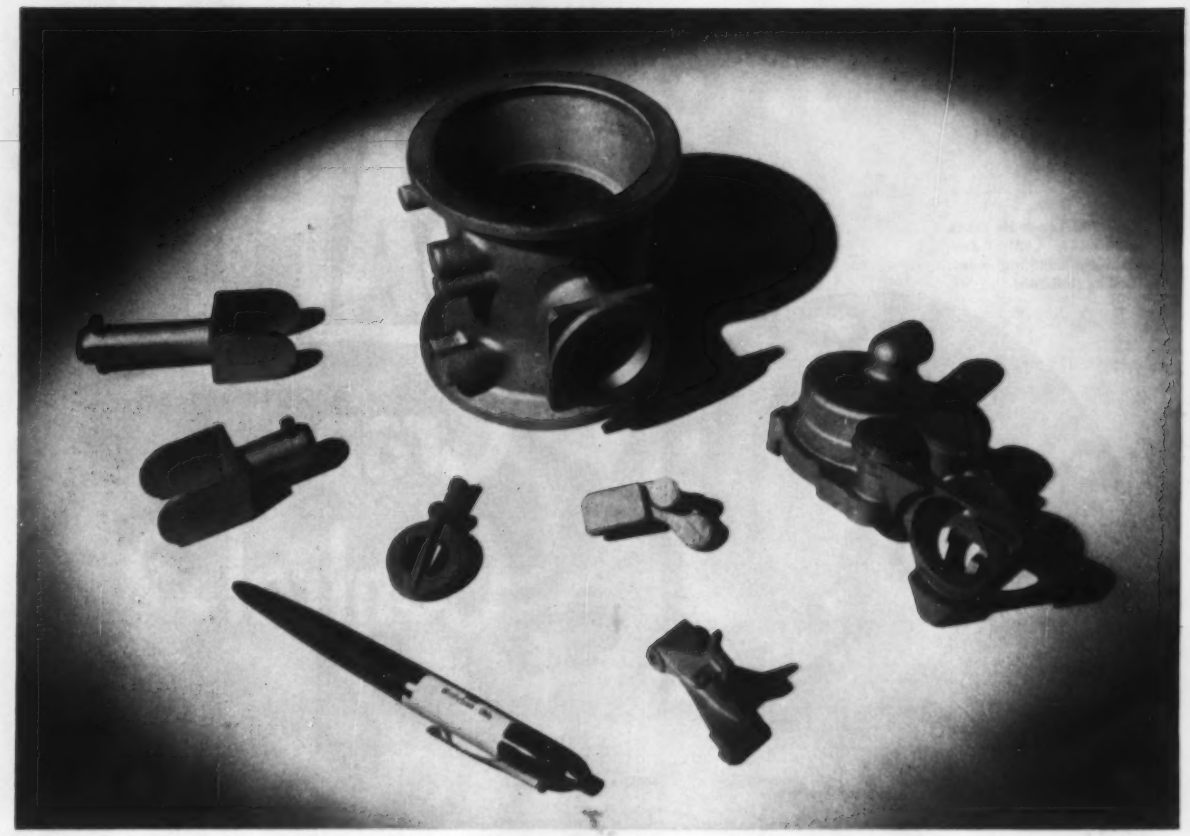
Look for power mower manufacturers to sell about 1.5 million units worth $150 million this year. That will compare to sales of about 1,350,000 units last year. Motor Wheel Corp., which last year got into the business by buying Reo Lawn Mower Division of Reo Motors Inc., hopes to do about 10 per cent of the business.

Straws in the Wind

The Pentagon will give priority to projects designed to save abaca, amosite asbestos, chrysotile asbestos, chromium, cobalt, waterfowl feathers and down, nickel and tantalum . . . A cement shortage may hamper the construction boom this summer . . . Silver manufacturing firms are experiencing a moderate boom as a result of brisker demand for silverware and products for industrial use . . . The Sears, Roebuck & Co. midsummer catalog lists price reductions averaging 10 per cent . . . Although it employs only 500, Rockwell Mfg. Co.'s Edward Valves Inc. this month completed an eight-month course in nuclear physics for 25 of its engineers; object: To get in on the ground floor to meet atomic power needs.

This Week in Metalworking

Steel warehouse business is brisk (page 37) . . . The Federal Trade Commission's merger report shows that the current splurge in acquisitions is high, but still below levels of the 1920s (page 38) . . . Capital equipment prices will edge upward in 1955 (page 39) . . . The market in helicopters is rising (page 45).



Stainless castings show up to 190,000 psi strength after 875 F hardening treatment

Foundries report ultimate tensile strength as high as 190,000 psi in investment castings of Armco 17-4 PH Stainless Steel. This precipitation-hardening grade is easy to cast. It fills thin sections and details nicely, surface finish is good and tolerances small.

READILY MACHINABLE Armco 17-4 PH investment castings machine readily to an excellent surface finish. The subsequent 1-hour hardening treatment at 875 degrees F will not distort the part nor damage the surface. It causes only a slight discoloration.

NUMEROUS SUPPLIERS Armco does not make castings. If you are interested in high-strength, low-temperature hardening castings with high corrosion resistance, just fill out the coupon. We'll send you a list of suppliers of investment castings and other types made of Armco 17-4 PH Stainless Steel.

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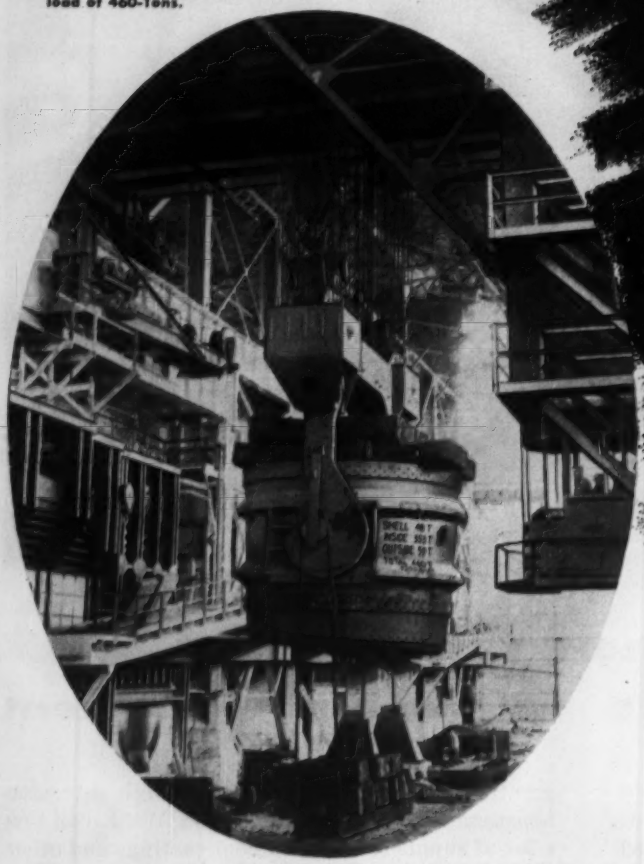
SAFE Crane Control

New 300-Ton ladle crane with EC&M Control successfully handling a test load of 460-Tons.



New dynamic lowering circuits for d-c crane-hoists come and go—are superseded by other new circuits, but the well-known EC&M Wright Dynamic Lowering Circuit Hoist Controller continues to be first choice for industrial cranes.

Quick brake-release and fast-operating LINE-ARC Contactors permit accurate spotting of heavy loads—resulting in fewer inching movements, which maintenance men recognize as a contributing factor to reduced upkeep.

Also important is that the operator has direct control (from the Master Switch) of all loads in the lowering direction. The EC&M Wright Circuit is SAFE.

When Buying Cranes It Pays To Specify E&M Control

6261

THE ELECTRIC CONTROLLER & MFG. CO.

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New Lift in Steel

A new buoyancy pervaded the annual meeting of the American Iron & Steel Institute last week.

No wonder. Even as executives gathered in New York, operating people at home were setting an all-time monthly production record. When the tallies are in for May, they will add up to 10.3 million tons of ingots. The previous high (10.2 million tons) was attained in March, 1953.

Production for the first five months of this year was no less imposing. At 47.4 million tons, it was 1 million tons short of matching that of the same period in 1953. It was 10.6 million tons, or 26 per cent, ahead of 1954.

It won't be surprising if production reaches a new peak this year. On the likely assumption that there will be no major strikes, the industry can produce 113.2 million tons of steel if it maintains an average rate of 90 per cent.

Let's take a look at the future through the eyes of Arthur B. Homer, Bethlehem Steel's president. He told AISI members that he sees a long-range era of stabilized progress.

Population will increase to 200 million in 1970. Per capita consumption of steel will gain accordingly.

Steelmaking capacity will increase an average of 4 million tons a year for the next 15. In 1970, the industry will be able to produce 185 million tons, or 60 million tons more than in 1955.

If Mr. Homer's prediction is fulfilled, here's what it means:

—Based on a cost of $300 per ton of integrated steelmaking capacity, the steel industry will spend $18 billion, or $1.2 billion a year, for 15 years. In the nine years since 1945, it spent $6.3 billion. This year, it is spending over $700 million.

—Average steel ingot consumption will be 1850 pounds per person in 1970. It will go into buildings, turnpike bridges, automobiles, appliances and a myriad of products still not conceived. Per capita consumption will be 1535 pounds in 1955. It was 1300 pounds in 1950.

—Improved technology will be reflected in more and better products for all.

The new lift in steel will have tremendous impact on the entire economy. Now's the time to plan for your share of the prosperity.

Irwin H. Such

EDITOR

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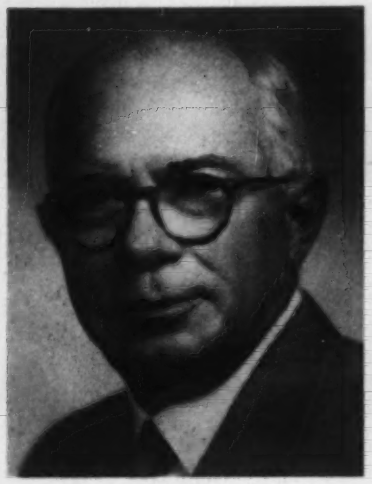
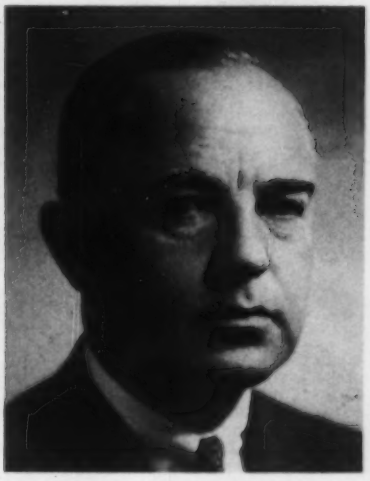


Max D. Howell
AISI

Arthur B. Homer
Bethlehem



John A. Stephens
U.S. Steel

On economic and labor fronts, these men see basis for . . .

New Optimism in Steel Industry

THE STEEL INDUSTRY'S traditional prince-or-pauper role is a thing of the past.

So says Arthur B. Homer, president, Bethlehem Steel Co., in predicting a long-range era of stabilized progress.

60 Million More Tons—He foresees an average increase in the steel industry's ingot capacity of about 4 million tons a year over the next decade and a half. Such a program, he points out, would mean that the steel industry 15 years hence would be about 50 per cent larger than it is today.

Speaking before the 63rd general meeting of the American Iron & Steel Institute in New York last week, he assumed the population will be 200 million by 1970, and a continuing increase in the per capita consumption of steel. He also assumed a continuation of the current "modern conservative" policy of steel company management, the public and government.

Definition—"The modern conservative," he said, "believes in incentives and rewards; in equality of opportunity.

"He believes that preservation of the integrity of the dollar is essential to the operation of a free market and an equitable system of incentives. He knows that this is the best way to stimulate the economy because it gives the dollar a constant meaning to savers, business planners and all others who want to look ahead."

Population—Max D. Howell, the institute's executive vice president, also foresees substantial growth ahead for the steel industry. New markets for steel are evidenced statistically in expanding steel consumption as measured on a per capita basis, he declared. "View this factor against the large population increases that projected trends now indicate and you see its import alike for the economic future of our industry and the rising standard of living for all Americans."

The institute executive estimated that steel production in the first half probably will exceed 57 million tons. If the high rate of output continues unchanged in the last half of this year, total production for 1955 will be over 114,000,000 tons, a new record. This would represent 91 per cent of the present rated capacity.

Unanimous—Optimism was general among the 1200 steel executives who attended the two-day session at the Waldorf Astoria hotel, May 25-26. Corridor talk and extemporaneous remarks by speakers pointed to a continuation of prosperity the remainder of this year.

The Schwab Memorial Lecture was given by Dr. L. A. Du Bridge, president, California Institute of Technology. Other features included two technical sessions—one on operations, with E. F. Lundeen, Inland Steel Co., presiding; the other, on product development, with D. I. Dilworth Jr., Crucible Steel Co. of America, presiding.

Labor—An industrial relations session was headed by John A. Stephens, United States Steel Corp., and a public relations session was chairmanned by Donald R. James of AISI. Dr. Henry M. Wriston, president, Brown University, was the scheduled banquet speaker—subject: "United States as a World Power."

Dr. Du Bridge, in his Schwab lecture, maintained that although the world's scientific center has shifted to the United States as a result of the last war, there is evidence of a scientific boom in Russia. He warned that America's lead is precarious. He urged every American industry to take the responsibility to further the growth of basic science in the U. S.

No GAW—The unemployment problem cannot be solved through the guaranteed annual wage, Mr.

Crucible's Dilworth (left), Inland's Lundeen head technical panels

Homer said. "Everyone would like to have constant employment" but such a condition is the end product of a combination of factors, the most important of which is the consumer.

"Those of us in the industry know that the campaign for more income security for hourly-paid employees has obscured real gains which have been made on that front. The steel industry's expenditures since 1946 of more than $6 billion for modernization and expansion have greatly broadened our product ranges and have enabled us to offer a far greater degree of employment stability than ever before was the case. The billions spent to diversify our products and, therefore, our consuming fields will continue to be an immense factor in stabilizing employment.

"Discussion of the so-called guaranteed annual wage," he said, "has diverted attention from the fact that there already exists an effective government - sponsored unemployment compensation system. Furthermore, it is a system paid for by industry. The compensation checks come from the states, but the funds from which the checks are drawn are created by taxes on industry. Our industry has paid into such funds more than $500 million since 1936."

Road Back—While 1954 was a year of unmistakable recession, the economy nevertheless leveled off at a relatively high plateau and the nation got back on the road to recovery which it is still traveling," Mr. Homer declared.

"I believe this phenomenon . . . reflects the operation of a number of prospectors in our economy which gives grounds for confidence that we are on the threshold of a period of stabilized growth.

"Such stabilizers as unemployment compensation, pensions, social security and veterans payments perform their role in maintaining spending levels."

Praises U. S. — Those factors, plus a reduction in personal taxes, mean that "disposable income after taxes actually increased during a time of technical recession," said Mr. Homer. He also paid tribute to the government's monetary policy showing adequate credit reserves, "while a limited amount of corporate tax reform improved the climate for investment.

"Last, but by no means least," he asserted, "I believe that private managers of business have learned a great deal out of the hard school of experience of the past quarter century and are capable of acting . . . with more insight and maturity than ever before in our history."

Depreciation—With the industry faced with the possibility of a further substantial increase in capacity in the near future, Mr. Howell said that a most trying problem is the fact that, due to increased construction costs, depreciation reserves are insufficient to replace existing capacity with comparable facilities. The federal tax laws have recognized this problem in a temporary manner with accelerated amortization, but there is still need for a more realistic and permanent solution on the part of the government, he declared.

Mr. Howell called attention to the co-operative effort in which the industry is engaged with the Department of Defense in the simplification of government specifications for steel. "We have written three handbooks which have been published and have submitted 18 fundamental specifications for 18 basic steel products. It is expected that these specifications will replace many times the number of specifications now current."

Industry Aids — About eight new product manuals have been issued recently. Others are in the process of being revised.

"Among the manuals newly brought out are two newcomers which are likely to be highly informative," he asserted. "These cover high strength low alloy steel and tool steel."

Arthur P. Woods Jr. (see photo) won the Institute Medal for his paper, "Some Statistical Methods Used in Studies of Steel Plant Operations." Dr. E. F. Osborn of Pennsylvania State University received the Regional Technical Meeting Award for his paper, "Phase Equilibrium Studies of Steel Plant Refractories Systems."

Armco senior research engineer, A. P. Woods Jr., wins Institute's Medal

PAUL O. GRAMMER . . .
President, ASWA

ROBERT G. WELCH . . .
Executive Secretary, ASWA

Steel Warehousemen Plan for Profit

F. WORCESTER Lovesocket V, owner of New Saugus Steel Service Inc., has a problem.

Business is good. New Saugus Steel is grossing about $2 million a year. Mr. Lovesocket is getting on in years, however. What's going to happen to his company after he dies?

Puzzler—His son could handle the business capably. But can the company hurdle the legal barriers complicating succession to a going business in the face of punitive estate and inheritance taxes?

All small businessmen face this problem. It's particularly acute in the steel warehouse industry, with its predominance of one owner or family companies. Several once-prominent warehouse firms have passed from the scene because estate settlement forced disposal of company assets.

Moral—The fictitious Mr. Lovesocket is the hero of "Where There's a Will," a "drama" given at the opening business session of the 46th annual meeting of the American Steel Warehouse Association in Boston last week. Pointing up the need for planning succession in advance of retirement, it brought out the legal, insurance and accounting angles involved in acquiring a forward look in business.

Practically all the convention speakers directed their remarks to some phase of planning for the future. Addresses included: "Achievement Through Service," by J. V. Honeycutt, Bethlehem Steel Co.; "Missions Accomplished," by F. H. Lovejoy, Wheelock, Lovejoy & Co.; "Planning, Family Style," by Robert G. Welch, executive secretary of the association; "So We Tightened Our Belts," by C. L. Hardy, Joseph T. Ryerson & Son; "Secret Weapons for Profits," a panel discussion on plant layout and materials handling; "The Challenge to Industrial Steel Distributors," by L. B. Worthington, U. S. Steel Supply

Retiring after 21 years of service (7 as executive secretary, 14 as president) Walter S. Doxsey is honored at steel warehouse association meeting. Shown are Mr. Doxsey (right) and F. H. Lovejoy (left) chairman, executive committee

Division, U. S. Steel Corp.; "Atomic Energy—Weapon for Peace," by Dr. Hubert N. Alyea, Princeton University.

Outlook—Authorities think the economy will consume 200 million tons of steel annually within 30 years. If the warehouse distributors merely hold their present share of this total, they will then be shipping about 30 million tons of steel a year, said Secretary Welch. This exceeds finished steel output in all but a few years before 1940. It is about double warehouse tonnage this year.

This prospective growth poses complex problems for the future, necessitating refinement of old distribution methods and development of new procedures and policies. Mr. Welch said that distributors must now face up to the challenge of the years ahead.

Specifics—Three areas for action were cited: 1. Plant problems, including employee relations and education, accounting, cost analysis, installation of labor-saving equipment, functional sales analysis, adjusting plant layout to fit needs and developing engineering and supervisory personnel. 2. Strengthening mill-distributor relationships, aimed at cultivating a better appreciation of the warehouse role in steel distribution. 3. Selling the warehouse industry to consumers through educational programs that point up the economies open to steel users through warehouse inventory service.

The convention marked the retirement of Walter S. Doxsey from active connection with the association after 21 years of service. Since 1941 he has been president. He will continue as a consultant. In appreciation for his long service and contributions to the steel warehouse industry, he was presented a sterling silver bowl.

New Officers—Succeeding him as president is Paul O. Grammer, of Grammer, Dempsey & Hudson Inc., Newark, N. J. Lester Brion, Peter A. Frasse & Co. Inc., New York, and M. R. Lowenstine Jr., Central Steel & Wire Co., Chicago, were elected vice presidents. C. L. Hardy, Joseph T. Ryerson & Son, Chicago, was named treasurer and Robert G. Welch, executive secretary. John E. Doxsey continues as assistant to the president.

Mergers: A Continual Rise Since 1949

	No. Companies Buying (1948-1954)	No. Companies Purchased (1948-1954)
Nonelectric Machinery	166	249
Fabricated Metals	91	161
Transportation Equipment	66	125
Electrical Machinery	70	111
Primary Metals	53	78
Professional & Scientific Instruments	24	47
Miscellaneous Manufacturing	18	20

Source: Federal Trade Commission.

Merger Report: Basis for Action?

A FEDERAL Trade Commission report shows: Mergers have increased to three times their 1949 rate and are nearing the 1946-1947 postwar peak.

Statistics — Analysis of some 1773 mergers in the manufacturing and mining fields from 1948-1954 reveals that almost two-thirds of them were made by companies with assets of $10 million or more. Companies with assets of less than $1 million accounted for less than 8 per cent of the total. The largest number of mergers (249) was recorded by the nonelectrical machinery industry (see chart). In metalworking, the biggest acquirers were Olin Mathieson Chemical Corp. with 18; H. K. Porter Company Inc., 13; and Food Machinery and Chemical Corp., 14.

The four-month economic study determined that there are several reasons for mergers. Companies usually need one of the following: 1. Additional capacity to supply a market already being supplied. 2. Lengthened product lines. 3. Product diversification. 4. Facilities to produce goods formerly purchased. 5. New distribution channels.

Two mergers out of five fall into the category of companies which want to increase capacity. In one merger out of four, companies are interested in broadening product lines.

Tax Help—Both acquiring and acquired companies are pointing out that tax savings are a frequent factor in mergers. Example: Willys-Overland Motors Inc. and Kaiser Motors Corp. Willys, in becoming the earning asset in the merger, obtained Kaiser's losses for tax credits against its future earnings.

Purpose of the report: After studying the facts disclosed, FTC says it will recommend if and what corrective action should be taken — including proposals for new legislation (see page 42).

FTC Gets Modern

The rules for handling cases brought before the Federal Trade Commission have been "overhauled and modernized."

In its revision of rules and procedures, the commission has attempted to follow the recommendations of the President's Conference on Administrative Procedure. It is felt that this "updating" will serve to minimize delay and promote added fairness and efficiency. These new rules will apply to formal and informal proceedings.

Included in the single document are changes which involve a provision for prehearing conferences and revision of the consent, complaint and answers rules, etc. Copies may be obtained from the Division of Legal and Public Records, Federal Trade Commission, Washington 25, D. C.

Machinery Prices: Catching Up

Makers see chance to realign profit ratios as order backlogs increase. The adjustment is overdue. Since 1939, their prices have risen 20 per cent less than the average

CAPITAL EQUIPMENT prices are edging upward. Boosts aren't widespread, but they will be if the cost of steel and labor goes up.

Best estimates are that the hike will average 5 to 8 per cent by year end.

Builders' Picture—Nearly half the equipment builders contacted by STEEL already have increased or "adjusted" prices this year. Chief factors: 1. Tough competition last year kept prices abnormally low and the current business pickup is permitting some prices to be brought into line with costs again. 2. Equipment has been improved, necessitating some upward price adjustments.

Warner & Swasey Co., Cleveland, boosted prices in December and again in January to bring profit margins up to pre-1951 levels. Biggest increase was 10 per cent on one model; some prices were unchanged; on one slow-moving item, the price was lowered.

New Models — Bullard Co., Bridgeport, Conn., increased prices during the fourth quarter last year: 5 per cent on one line, 8.5 per cent on another and 15 per cent on a third. "But," officials point out, "the increases were in connection with new types and models of equipment and actually represented adjustments necessary to product change."

Although new order indexes for most capital equipment are rising (March was the top month for machine tools since September, 1953), the upturn hasn't appeared on all balance sheets. That's why some firms are cautious about increasing prices too quickly. Said one Midwest firm: "Because of low prices and low production, we lost money in January and February. But because of competition, we feel we can't raise prices yet."

Orders—A crane builder, noting an order increase in the last two months, says that competition kept prices so low last year that strong demand now could boost them as much as 15 per cent—"and then we'd be just catching up."

Absorption of any increased steel or labor costs which may come from the autoworker and steelworker negotiations just isn't in the cards. "We did that last year," comments an eastern executive, "and we're too close to the profit line to do it again."

Costs—Steel and labor cost increases will not affect all companies alike because of differing ratios between them and over-all selling price. However, one vice president, who feels his Chicago operations are average, estimates his prices go up about 5 per cent with each $4-per-ton steel boost and 5-cent pay hike.

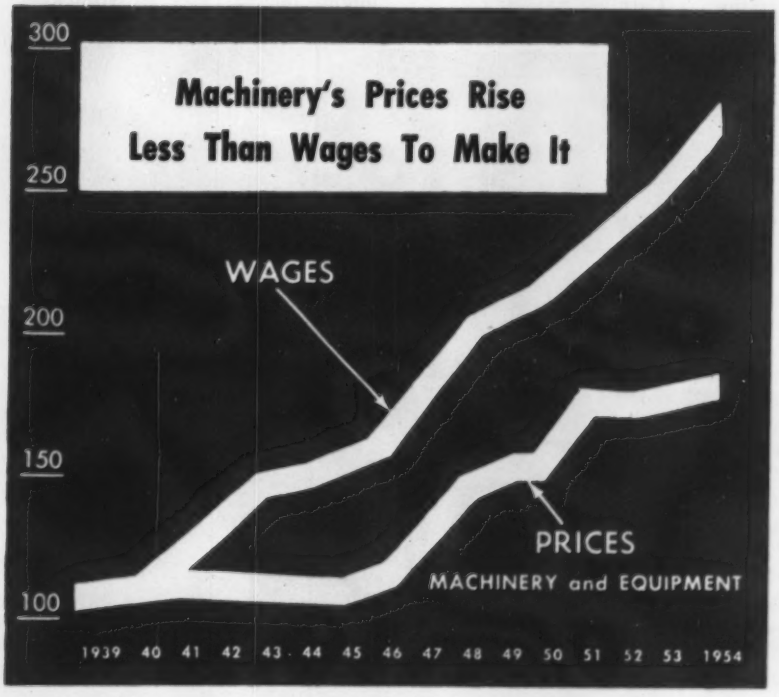
For some firms like Osborn Mfg. Co., Cleveland, competition is not so much a factor in pricing as engineering and research costs are —much of its equipment is made to order. Officials say these costs are substantially higher than ever before and that they'll keep going up.

Delivery Factor—If you're in the market for new equipment, you might keep delivery time in mind, too. Officials at Whiting Co., Chicago, say that demand for shorter-than-normal delivery can increase prices as much as 15 per cent. "On the other hand," comments another company sales manager, "if they are in that big a hurry, they're usually willing to pay the tariff."

"When you're talking price boosts in capital equipment, don't forget another factor," emphasizes one manufacturer. "Equipment today is a better buy, not only in performance but in actual costs." A Machinery & Allied Products Institute survey substantiates his claim.

Imbalance—Prices of machinery and equipment have risen only 80 per cent above the 1939 level, compared to nearly 100 per cent for all industrial prices. Wages paid by machinery manufacturers for the same period climbed 170 per cent (see chart).

Compared to soft goods, capital equipment prices are too low, say officials of Giddings & Lewis Ma-



chine Tool Co., Fond du Lac, Wis. The industry historically is subject to violent business cycles, and G&L men believe a tax policy readjustment for producers of certain types of equipment is necessary to permit more profits to be retained for the lean periods.

GE Expands in Virginia

New electronics control plant in Waynesboro, Va., typifies GE's decentralization program

ANOTHER STRIDE in General Electric Co.'s decentralization program was made by moving its Specialty Control department from Schenectady, N. Y., to a new plant in Waynesboro, Va.

Goal of the program is to make each product department a nearly independent business, with its own organization for marketing, manufacturing, engineering, finance and employee relations.

Soaring Demand—Built to meet the growing demand for electronic controls used in automated processes, the new plant eventually will employ between 500 and 600 people —annual payroll is $2½-million. Although the plant is not operating at full capacity, plans for its expansion already are under way.

Use of electronic controls is expected to double within the next five years and triple by 1965. Products made in the Waynesboro plant range from thumb-size relays for aircraft electrical systems to complex programming systems that control the operations of 100-ton presses.

Features Flexibility — In the 190,000-sq-ft plant, all machinery is free standing, including presses, brakes, lathes and mills. Connections for water, air and power are made to overhead supplies with flexible couplings. The entire plant can be reorganized with new production lines and a new layout within two weeks.

Louis T. Rader, general manager of the Security Control department, says the division was moved because it was sound business to do so. Waynesboro was chosen because of its transportation facilities, nearness to markets, its schools, public utilities and community services.

Competition is tougher, but the outlook is good for . . .

Big Splash in Paint Spray Systems

"IT LOOKS like another banner year for the paint spray equipment people," says R. G. Callison, sales and advertising manager of Peters-Dalton Inc., Detroit. Most other makers agree.

One firm reports business is up 100 per cent from a year ago. Others put their increases at 10 per cent and up. "Our 1955 sales are considerably ahead of last year which was our best previous year," states Harold P. Ransburg, Ransburg Electro-Coating Corp., Indianapolis.

Developments—There's a cloud moving in on the rainbow, though: Fast-rising sales costs are skimming off the pot of gold. Competition has increased noticeably of late, especially in the last 18 months, notes W. P. Sheetz, president, R. C. Mahon Co., Detroit.

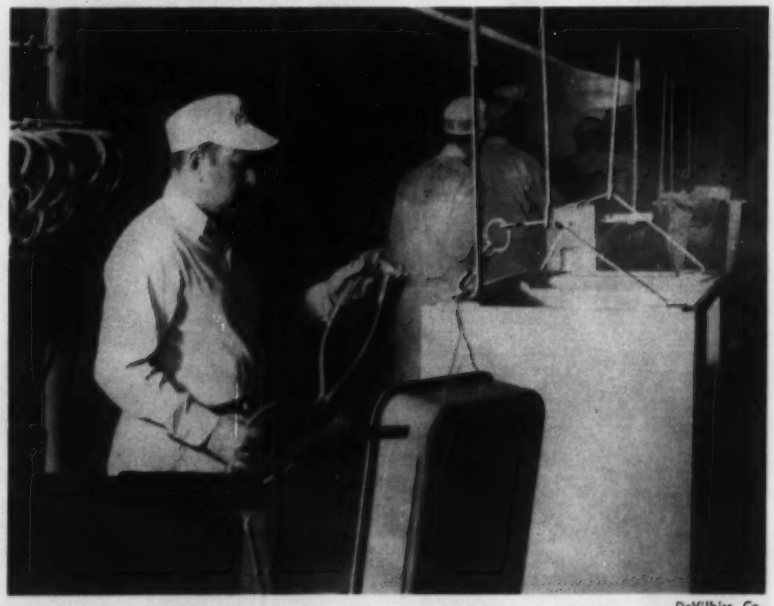
In an industry that is constantly refining and improving its products, the added competition is just another spur to continuing development. One producer ranks the industry's latest achievements in this order: 1. Automatic spray finishing. 2. Heated materials finishing. 3. Catalyst finishing.

Customers — Another development gaining in popularity is centralized pumping systems: Having all the paint in one room or area, and then pumping it out to spray booths. As many as six colors can be used in one booth. Easier maintenance also is a top-priority project.

The automotive industry is one of the biggest buyers of painting equipment. Not only are the auto producers good customers, but a boomlet has come along from auto refinishers and dealers. Demand for distinctively colored cars is one reason behind it. Some dealers, for example, stock mostly single color cars and two or three tone them to suit the customer. Appliances and the construction fields are other big markets.

Specialties—Annual dollar volume for the six major companies and numerous smaller ones in the equipment industry is estimated between $40 million and $100 million. The difference in figures depends on just what is classified under paint spray equipment.

The higher figure, for example, might include special equipment



DeVilbiss Co.

In this installation, a six-line circulating system delivers different colors through paint heaters to the gun. Filters carry overspray away from operator

like that made by Alemite division, Stewart-Warner Corp., Chicago. About 70 per cent of Alemite's spray business is in equipment for hard-to-spray materials like mastics, plastics, calking compounds and oil. Undercoating for cars and deadener for appliance cabinets are other examples.

Steel Marking Set for August

The Defense department probably will have steel marking in effect by Aug. 1. A standard worked out by the Business & Defense Services Administration and American Iron & Steel Institute is in final stages of preparation. It will cover 75 items, mostly of small tonnage.

There is continued interest in marking other metals. International Nickel Co. reportedly has a proposal for marking nickel-bearing materials.

Copper and brass mills also are considering the problem. At least one mill plans manual marking at first; machine marking to follow.

Aluminum standards already have been set up.

NLRB Speeds Operations

The National Labor Relations Board decided 43 per cent more unfair labor practice cases in the first quarter than in the same period last year. It supervised 5.7 per cent more bargaining elections.

A tally by Commerce Clearing House shows the board's activities this way: Unfair practice cases, 90 in first quarter, 1955, versus 63 in first quarter, 1954; representation elections, 965 to 913; bargaining agents chosen, 629 to 552; election decisions, 378 to 393.

In the elections during the 1955 quarter, 91 per cent of eligible employees voted in representation elections; 72 per cent of those voting favored union representation.

Steel Expansion If Merger O.K.'d

A 3 million ton increase in steelmaking capacity is contemplated if the proposed merger between Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. goes through.

The program would add 2 million tons in the Chicago district and 1 million in the Youngstown district where Sheet & Tube now has its major plants.

Steel gets loaded in one of ten ships that are . . .

Bethlehem's Coast-to-Coast Link

BETHLEHEM STEEL Corp. uses a little-known subsidiary, Calmar Steamship Corp., to help link its east and west coast operations.

Calmar carries large and assorted tonnages of steel from coast to coast via the Panama canal.

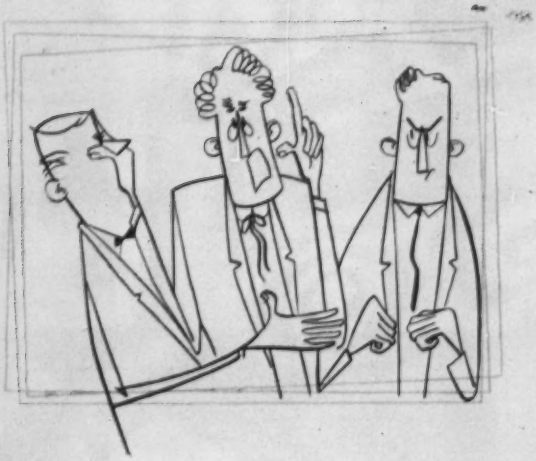
Ten Ships—Eight Liberties purchased in 1947 and two other more recently acquired vessels form the fleet. Each vessel, after extensive alteration, is capable of stowing 110 ft lengths of steel under its decks. A 168-ft area forward of the bridges will accommodate longer lengths under certain conditions.

The line has a history dating back to 1927. Continuous service was maintained until early 1942, when the U. S. requisitioned Calmar's 14 ships for use during World War II. War record: Eight ships sank; five requisitioned for title by the government; one sold.

Problem Solved — Because the vessels travel from the temperate to the torrid zone and back again, a way to meet the extremes in weather had to be found: Condensation and rust could damage the steel cargo. A pressure system—cargo hold dehumidification—was the answer. The dehumidification vent dries the air which is delivered through a duct system to each hold. By providing sufficient dry air when the holds are closed, a positive pressure is maintained throughout the voyage. All cargo is loaded so each unit receives more than adequate dry air circulation.

Where to?—Calmar Line vessels sail from Philadelphia and Sparrows Point, Md. They arrive at Long Beach and San Francisco, Calif., Portland, Ore., and Seattle, carrying sheet steel, tin plate, cold-rolled coils, black and galvanized wire, pipe, plates, wire rope, structural steel, palletized nails, etc.

Special gear and lift trucks are needed to help stevedores unload the ships. Each vessel has equipment which lifts 30 tons.



Washington Clamors About Mergers

■ ANTIMERGER talk grows louder.

The Federal Trade Commission's merger report will add to the volume with its statistics (see page 38) that can be used by congressional committees, the Justice department and the FTC itself.

Facts—The commission's study is noncommittal. It's a reportorial job on how many, how and why mergers have occurred, plus a summary of pertinent statutes. It makes no legislative recommendations. Nor does it hint how (or if) the FTC will modify its approach.

A big reason for the strictly factual nature of the report is that its authors couldn't agree on recommendations. The study was prepared by FTC's Bureau of Economics under Dr. Jess W. Markham's direction.

Another Story—There's no such uncertainty among some legislators. Sen. Paul Douglas (Dem., Ill.) told the House Antimonopoly Subcommittee that restrictions should be made on corporate size. He also wants the Justice department to approve all corporate mergers, with the burden of proof on corporations to show that competition would be aided by the move.

Sen. John Sparkman (Dem., Ala.) urges that the wave of mergers be checked by more rigid application of the laws.

Tangent — And in the House, hearings last week on aluminum stockpiling by a Small Business Committee unit peered into hints of monopoly in basic aluminum. Chairman Sidney R. Yates (Dem., Ill.) says he will consider "possible legal recourse by the government."

Aluminum Co. of America is especially sensitive about monopoly charges because next January it's scheduled to show how it complied with past antitrust rulings.

Materials Matters

• If general business continues good, look for a return of government controls on nickel before the year ends. The shortage of the metal is that serious.

• This summer the Office of Defense Mobilization again will consider another round of aluminum expansion. If it comes, Washington planners want to bring in a producer other than Alcoa, Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp.

• About 464 million lb of aluminum will be required for the Air Force's "tip" tank program. The units are extra fuel tanks which are jettisoned by a plane in flight when empty.

Pentagon Patter

• Changes in specifications have delayed placing initial contracts in the Air Force's $84-million program to buy machine tools. First awards probably will come approximately June 20 (see STEEL, May 16, p. 67).

• Look for the Air Force to develop more light cargo-handling equipment. Now ready are light pallets made of aluminum and magnesium. Also under development is light construction equipment. The Air Force has a tractor that can be dropped by parachute to carve out temporary runways in ice.

• Watch for new emphasis by the Pentagon on fundamental research. Development men believe we're at about the last page in the textbooks on aerodynamics, metallurgy and many other subjects. Needed is more basic study to write new pages.

Meet Roger Gay: He's the new director of the Division of Cataloging, Standardization, Inspection & Quality Control under the assistant secretary of defense. He can be reached at the Pentagon, Liberty 5-6700, Ext. 72807.

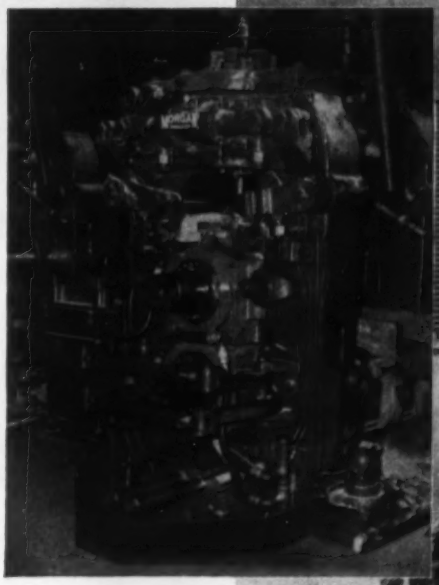
Mr. Gay is on leave from Bristol Brass Corp. where he is chairman of the board. President of the American Standards Association for the last three years, he has been serving as part-time consultant to the Defense department and now will devote full time to the Armed Services' program for standardization.

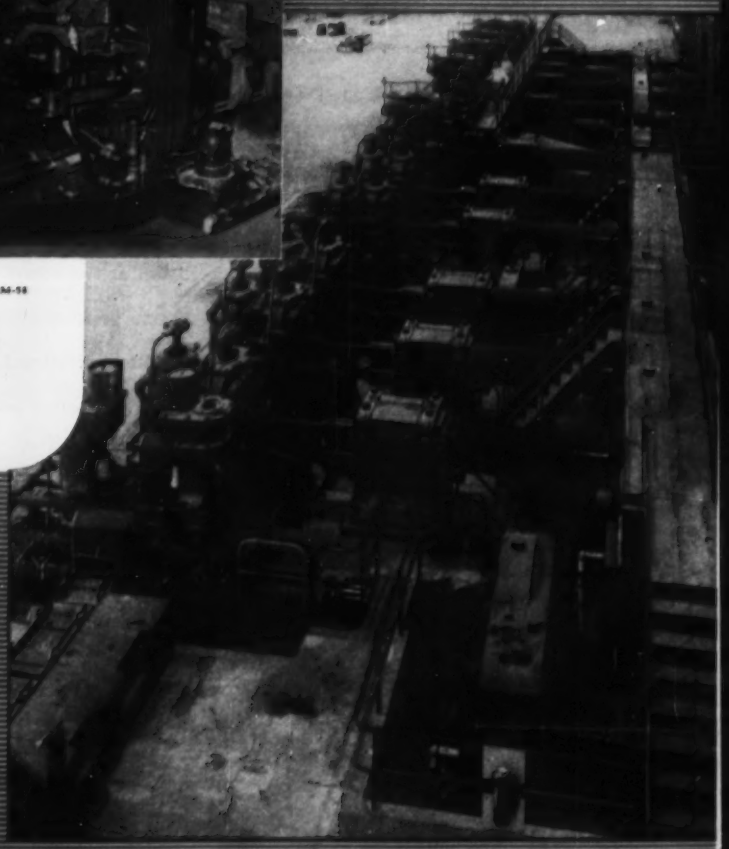
FAIRLESS Makes Records

WITH NEW

MORGAN Skelp Mill

Hailed as one of the great strides toward the increase in American steelmaking capacity is the Fairless Works of the United States Steel Corporation at Morrisville, Pa. National Tube Division's 18" Skelp Mill, a vital part of this enterprise, was designed and built by Morgan Construction Company. Product gauge is assured by rigid closed top roll housings and MORGOIL roll neck bearings. Four ton slabs of steel become four ton coils of high quality skelp. For these, Morgan handling equipment meets exacting requirements for the safety and comfort of the mill operators with no loss of efficiency.





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firebrick linings in hot metal cars and hot metal mixers provide extra tonnage that means extra savings

The superior toughness and uniformity of KX-99 in hot metal car and hot metal mixer linings has provided such outstanding service records, many leading steel companies have standardized on their use.

The exceptional properties of KX-99 brick enable them to better withstand erosion and slag action. Uniformity of size permits laying up KX-99 with very thin joints to better withstand the scouring and washing action of molten metal.

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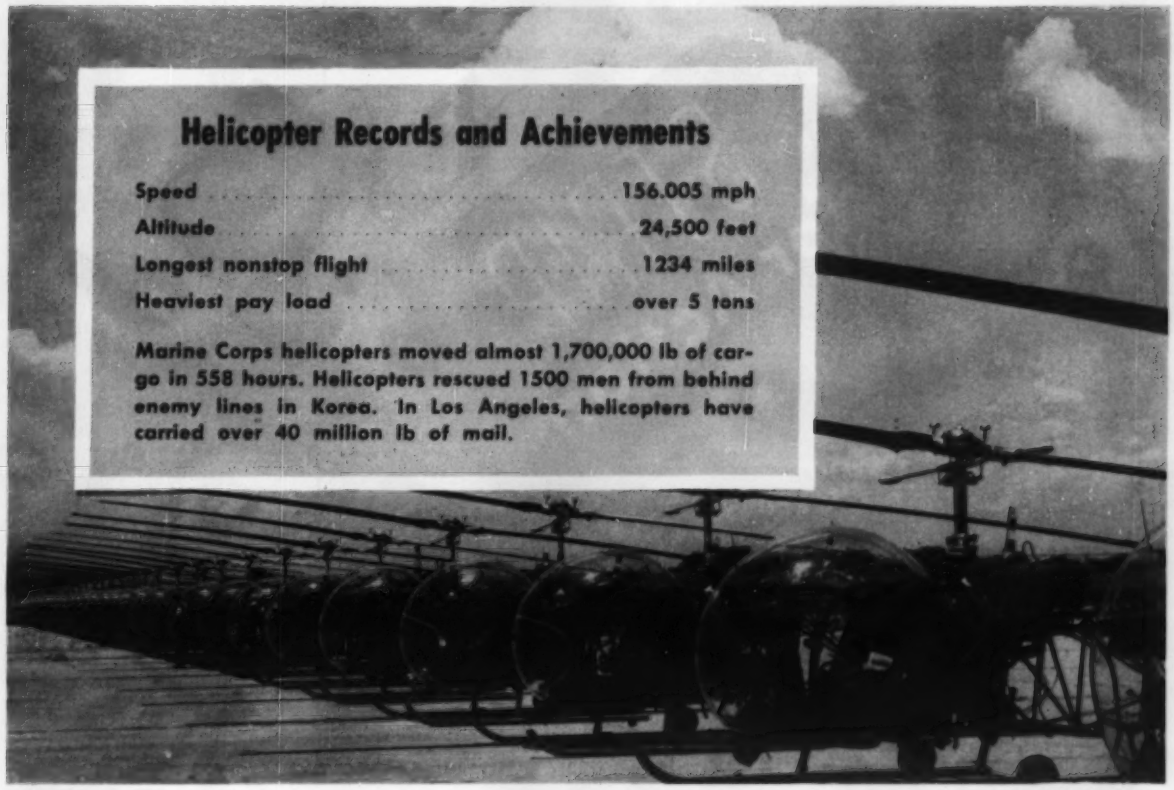

Helicopter Records and Achievements

Speed	156.005 mph
Altitude	24,500 feet
Longest nonstop flight	1234 miles
Heaviest pay load	over 5 tons

Marine Corps helicopters moved almost 1,700,000 lb of cargo in 558 hours. Helicopters rescued 1500 men from behind enemy lines in Korea. In Los Angeles, helicopters have carried over 40 million lb of mail.

Bell Aircraft Corp.

Big Future for Whirlybirds

Industry foresees expansion of helicopter making and operation approaching the scale of the present airplane industry. Increased 'copter lifting capacity expected soon

TODAY's covey of whirlybirds includes some 6000 military and 300 commercial helicopters.

Eventually, helicopters will carry 133 million passengers annually, predicts Civil Aeronautics Administrator Frederick B. Lee.

Big User—The Armed Forces take more than 90 per cent of production, using the whirlybirds for air-sea rescue to artillery spotting. Civilian helicopters carry mail, ferry passengers and even prospect for uranium. Last year's cilivian production was 125.

Better planes are coming. Piasecki Helicopter Corp., Bell Aircraft Corp., Hiller Helicopters and Sikorsky Aircraft Division, United Aircraft Corp., are working on helicopters with stronger engines and bigger payloads.

For Freight, Passengers — Two main lines of development of the transport helicopter were predicted by Dr. Igor Sikorsky in the Clayton Lecture delivered before the Institute of Mechanical Engineers in London.

Passenger models will change. Larger or more entrance doors may be used to speed loading and unloading. Larger windows also may be used.

Expected in the near future are freight-cargo helicopters designed to lift any type object or load and carry it below the fuselage. These craft would be equipped with crane devices to pick up an object while hovering over it.

Possibility—The pilot cabin may be placed below a narrow tubular fuselage behind the center of gravity of the ship. While upward vision would be obscured, an excellent view of the object to be lifted would be afforded.

Dr. Sikorsky sees no limitation on the size of helicopters. He predicts the use of conventional engines and transmissions for machines of up to 100 tons. Expected in future helicopters, particularly the large ones, are heavier disc loadings and lighter power loadings. In larger rotors it may be advantageous to use more blades of a moderate chord to increase smoothness and decrease control loads of the aircraft.

Aircraft engines are expected to continue as the chief power plant, but turbines will be used increasingly on multiple engine machines.

AF Needs Improved Engines

General O. P. Weyland, commander, Tactical Air Command, says that more emphasis should be placed on the development of engines. He wants to see improved engine maintenance, shorter lead time between drawing board and flight time, more speed and the ability to land and take off on shorter runways.

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

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has over 50 years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Volume will pick up again this year as . . .

Filemakers Tune Up Sales Tools

FILEMAKERS will ring up sales of about $27.2 million this year. Including rasps and rotary files, this beats the $24-million performances in 1953 and 1954, though it's lower than 1951 and 1952's. Sales then were spurred by the Korean conflict and jumped to $29 million.

The enviable stability of their business hasn't made filemakers smug. The dozen or so big companies which account for more than 90 per cent of the industry's volume energetically promote the fact that they make their product in more than 3500 design combinations, sizes and tooth patterns, each type designed for a specific cutting job.

Volume—One maker says the production of modern machine-cut files is the biggest chiseling job in industry. It's done on machines that are a far cry from the early jobs. One of the first, invented in 1765 by a Scotchman, was smashed in a fit of pique by its creator because its waterwheel didn't turn it fast enough. Today, billions of teeth a year are cut in forged tool steel blanks by reciprocating chisels. Upward of 12,000 tons of steel are used a year, the cost of which can run as high as $500 a ton. Round, square and other shapes of bar stock are needed.

Hand files are divided into the two general classifications of Swiss and American patterns. In unit sales, the American pattern takes about 90 per cent of the total market. These files again are divided into numerous classifications by tooth type.

Precision — Swiss pattern files are designed for precision work. They are widely used by tool and die makers, instrument makers and the metalworking industry. Says Frank Green, vice president of sales for Delta File Works, Philadelphia: "The Swiss pattern sales are regional. Right now, for instance, there's little volume business in the South."

Rotary files account for less than 20 per cent of the total dollar volume. During the war, the aircraft program built the rotary file business to near the $10-million mark annually. Today, makers are promoting their use energetically as a means of reducing hand finishing costs.

Future—Despite the increasing emphasis on mechanization, there's a good outlook for filemakers. As they point out, it's impossible to design perfect finish into every machining operation. As long as metalworking's around, they smile, we'll be in business.

Productivity, Not GAW

National Association of Manufacturers says: Jobs are created only by full production

"HIGH-LEVEL employment cannot improve the national welfare unless it is accompanied by high-level production," states a National Association of Manufacturers' study.

"So People May Prosper" presents NAM's recommendations for national prosperity. Basic principles: Full production and increased productivity, not a guaranteed annual wage for employees.

Future Help — "Investment spending has more than an immediate impact on economic activity. It has a long-run stimulating effect on employment and growth that consumer spending does not have. People have to be employed to produce machinery and other capital goods just as they have to be employed to produce consumer goods," states the NAM report.

Recommendations for an expanding economy include:

1. Get a steady flow of investment capital from individual savings.

2. Increase the incentives to invest capital by removing discriminatory tax obstacles.

3. Keep government control at a minimum so that direction is taken and decisions made by the people who have a personal stake in the outcome.

4. As soon as possible, government should get out of competition with business.

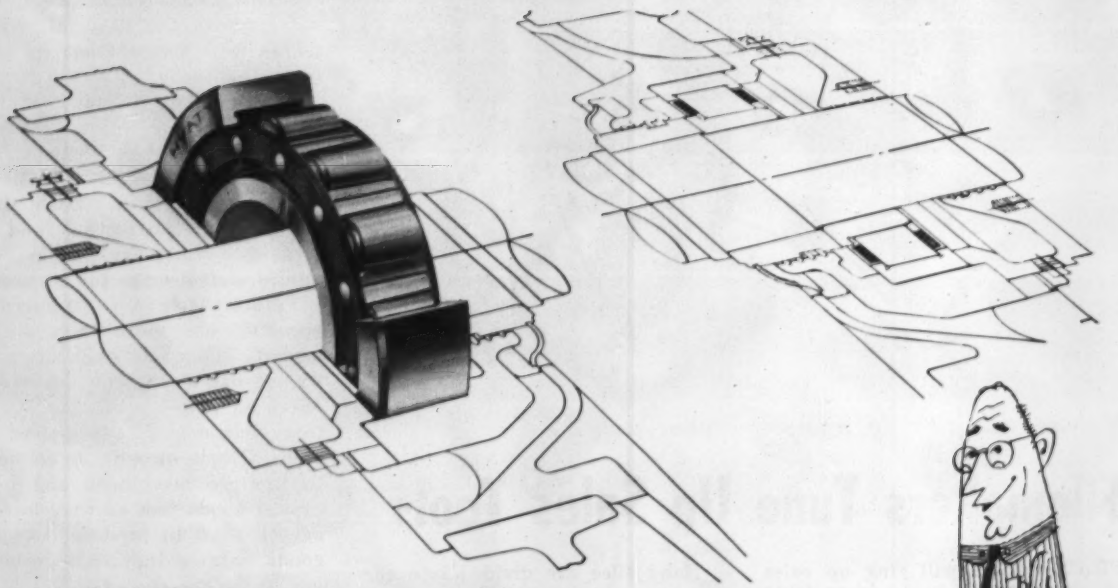
5. Industrial peace should be based on sound human relations between employer and employee.

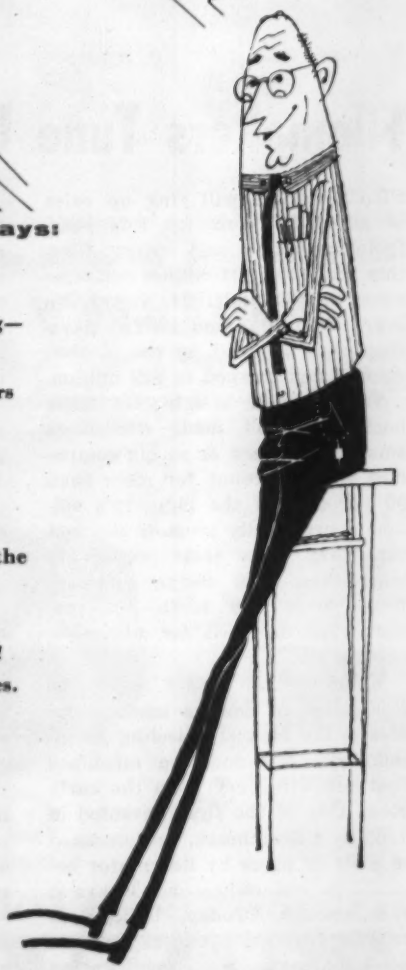
Another Consideration—The report points out that in the next 20 years, the U. S. population may grow to 220 million and that the economy will be expected to supply jobs for some 20 million more workers. The only solution: Strengthen the productive capacity of the nation now.

Another point emphasized: Without rapid growth and expansion of productive facilities—through capital investment—the nation will not be able to keep pace with the growing requirements for jobs, goods and services.

How Hy-Loads can help you . . .

OVERCOME OVERLOADING





HY POTENUSE, the sage of the slide rule, says:

This HYATT Hy-Load is heading for a long hard life. It's been designed into as tough a job as you can hand any bearing—the armature shaft of a steel mill motor.

These HYATT Bearings must maintain the armature on centers with very close running clearance despite the fact that *steel mill motors are frequently overloaded and are regularly reversed under full load!*

But ability to "take it" isn't the only reason leading motor builders mount HYATTS on both ends of armature shafts: the offset of the flanged inner race provides vital *inbuilt, non-adjustable free end float*, permitting the armature to center itself electrically. What's more, HYATT'S *separable and interchangeable* races facilitate quick replacement of armatures.

See why so many smart designers agree? *You can't go awry when you specify—*

YOUR COMPLETE LINE
OF CYLINDRICAL ROLLER BEARINGS

HYATT

STRAIGHT BARREL TAPER

ROLLER BEARINGS

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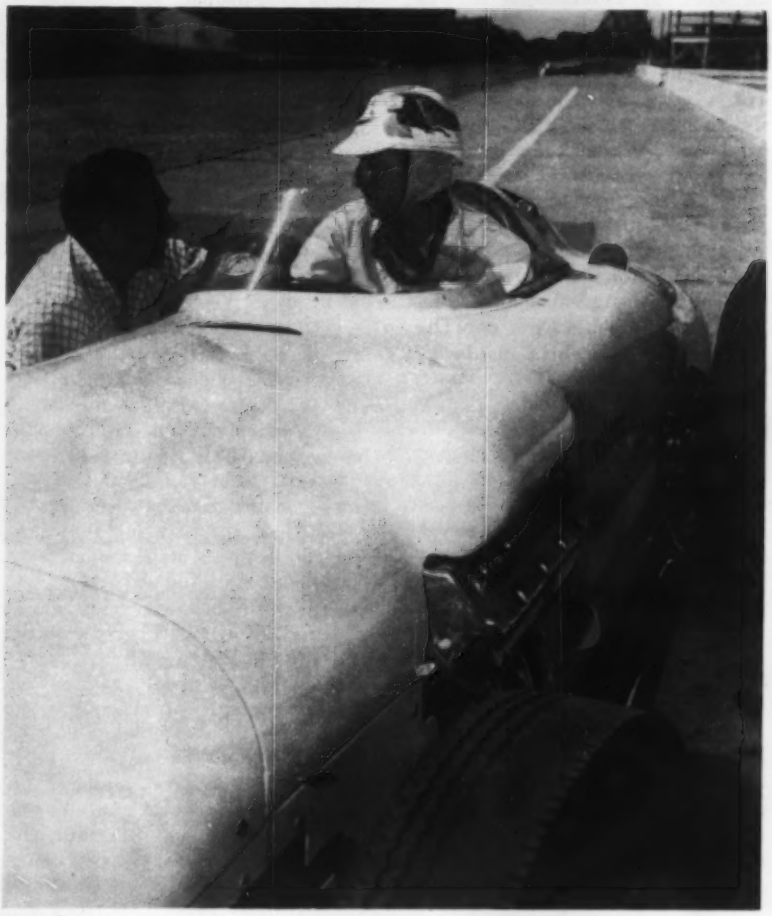

This Chrysler-engined car holds "500" speed record

Is Indianapolis Worth-While?

MEMORIAL DAY is taking on a second meaning in the minds of some: A day to remember the Indianapolis 500-Mile Races of the thirties and before. Despite the remarkable increases in speed on a track that was built shortly after the turn of the century for speeds of 85 mph, these people long for the days when Indianapolis was not "a Meyer-Drake derby."

Meyer-Drake 270-cu-in. engines powered every car in the starting field of the 1954 race. Other cars there, like the Ferrari V-12, the Novi V-8 and the supercharged 180-cu-in. Meyer-Drake failed to qualify. Although Jack McGrath hung up a qualifying record of better than 141 mph and Bill Vukovich won at a record average speed of 130.8 mph, not a few feel that the famous "500" proves little today except that one car inevitably will get there first.

Background—A glance at the history of the race certainly cannot fail to bring out the color of "the good old days." The first race in 1911 was won by Ray Harroun driving a Marmon Wasp, "the easiest riding car in the world." In winning, he used a rear view mirror for the first time.

Four-wheel brakes were used first at Indianapolis by Jules Goux, a French driver who won in 1913 with a Peugeot. In 1925, DePaolo made his record win driving a car equipped with unheard-of balloon tires. These 5.25 jobs used 30 lb of air pressure and gave him an amazing increase in tire durability. Perfected springs and shock absorbers, as well as fundamental principles of suspension design, also were proved at the race.

Galaxy — In the early years, names like Marmon, Fiat, Mercedes, Simplex, National, Mercer, Stutz, White, Maxwell, Excelsior, Premier, Studebaker, Packard, Lincoln, Alfa-Romeo, Maserati and Buick were sprinkled profusely on entry lists. In 1932, Studebaker entered four cars, Hudson two and Hupmobile one. Private entrants brought a Chrysler-powered special, a Buick-powered special and others. There were 16 semistock cars in the race.

This representation of semistock cars persisted well through the thirties, perhaps reaching its peak in 1935. That year a group of Detroit Ford dealers sponsored the building of ten new front-drive Ford V-8-powered cars. Ford parts were used where possible, including brakes, crankshafts, rods and valves, as well as engine blocks, heads, etc. These cars showed top speeds of about 130 mph and did a lap in about 113 mph.

Unfortunately, time ran out. It was possible to qualify only three of the cars, and none finished, but typical of the legendary Harry Miller, who built them and other cars in the race, every car running at the finish had an engine bearing the Miller name. It is probable that about this time there was a hue and cry that the race was becoming a "Miller derby."

For Science—There are records to show that in 1923 one of the original builders of the speedway questioned what it was proving. Carl G. Fisher, following the race that year, announced that a meeting had been called to decide whether the speedway should continue. In observing that considerable investment was required to modernize

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the facilities, Mr. Fisher pointed out: "The objective of building the speedway was for scientific work; the sporting interest was entirely secondary at that time and will be in consideration of the future.

"If the automobile manufacturers really want the big, practical testing laboratory, it will be continued. If not, it will be sold for other purposes."

The fact that the speedway was not sold until four years later indicates that they did.

Proving Ground—There was a mighty good reason why the auto industry needed the speedway in those days. The many small manufacturers struggling to improve their product and even the few larger companies could not afford elaborate testing facilities and proving grounds. The track was made available to them not only on the day of the race, but during most of the year to experiment with ideas under the most exacting and grueling high-speed test conditions.

Many developments recently introduced on passenger cars, like vacuum assisted brakes, were developed at Indianapolis many years ago. Some, like front-wheel drive, remain possibilities for the car of the future, as centers of gravity continue to go down and the driveshaft comes in for a jaundiced eye. Other developments, like supercharging, have been in and out of the auto industry for a number of years.

It is almost a truism to say that Indianapolis was the primer of automotive fundamentals in this country. But in large measure, the auto companies have taken over in the development field with more elaborate proving grounds. The reason for the transition is obvious: The auto industry and its knowledge outgrew the testing medium provided by Indianapolis. Instrumentation and laboratories, coupled with suitably varied courses and conditions, enabled the auto companies to move ahead better in the special problem of passenger car development.

They Use It—That is not to say that Indianapolis has dropped out of the development picture completely, particularly for automotive suppliers. Champion Spark Plug Co. reports that thanks to its work at Indianapolis it was ready for high compression in passenger car engines. Monroe Auto Equipment Co. reports lessons it learns today in shock absorber life and function will be applied to the passenger car shock absorbers of tomorrow. Perfect Circle takes pride in the fact that the same piston rings proved at Indianapolis are supplied to passenger car and truck owners on the highway.

Also giving a great deal of credit to Indianapolis is Firestone Tire & Rubber Co., which made its mark in the tire world partially because of its successes at the speedway. It reports that as a direct application of principles learned on the track, it has brought out its "500" tire for passenger cars, and that a tire almost exactly like the Indianapolis race tire in principle was adapted to jet planes which must land at 250 mph.

Also at the speedway are Magnaflux Corp. and Voigt Hose Co. They cite the Memorial Day classic as a continuing challenge for their products and processes. Their experience equips them to meet future passenger car problems. And the mechanics at Indianapolis figure that plenty is being learned directly from the cars themselves in terms of special fuels, new metals and improved methods of spring suspension.

Progress—Speeds continue to increase, and more cars finish each year. Those facts demonstrate that the cars are improving. Their outward similarity is occasioned by the fact that there is only one best way to do a job, and the job at Indianapolis is to go straight ahead and turn left at the greatest possible speed for 500 miles. Under existing regulations, the 270-cu-in. Meyer-Drake in the Kurtis chassis seems like the best bet, though no one doubts that something better will be coming along one of these days. Auto engineers seriously doubt if much will be learned from it for your car, however. Your car must do more than go straight and turn left.

Most people observing the 39th running of the Indianapolis 500-Mile-Race were unaware that the track originally was built as a proving ground for automobiles. But the blinding blur of soul stirring speed unfailingly moved them to thoughts of better cars for themselves.

Thus does Indianapolis keep alive in the hearts of men the dream of better cars it has helped to make come true. The auto engineers know: *They* never miss Indianapolis.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994†	676,269
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,010

Week Ended	1955	1954
Apr. 23	225,074	157,710
Apr. 30	231,021	159,206
May 7	215,756	154,640
May 14	221,746	153,796
May 21	218,972†	157,993
May 28	214,000*	148,744

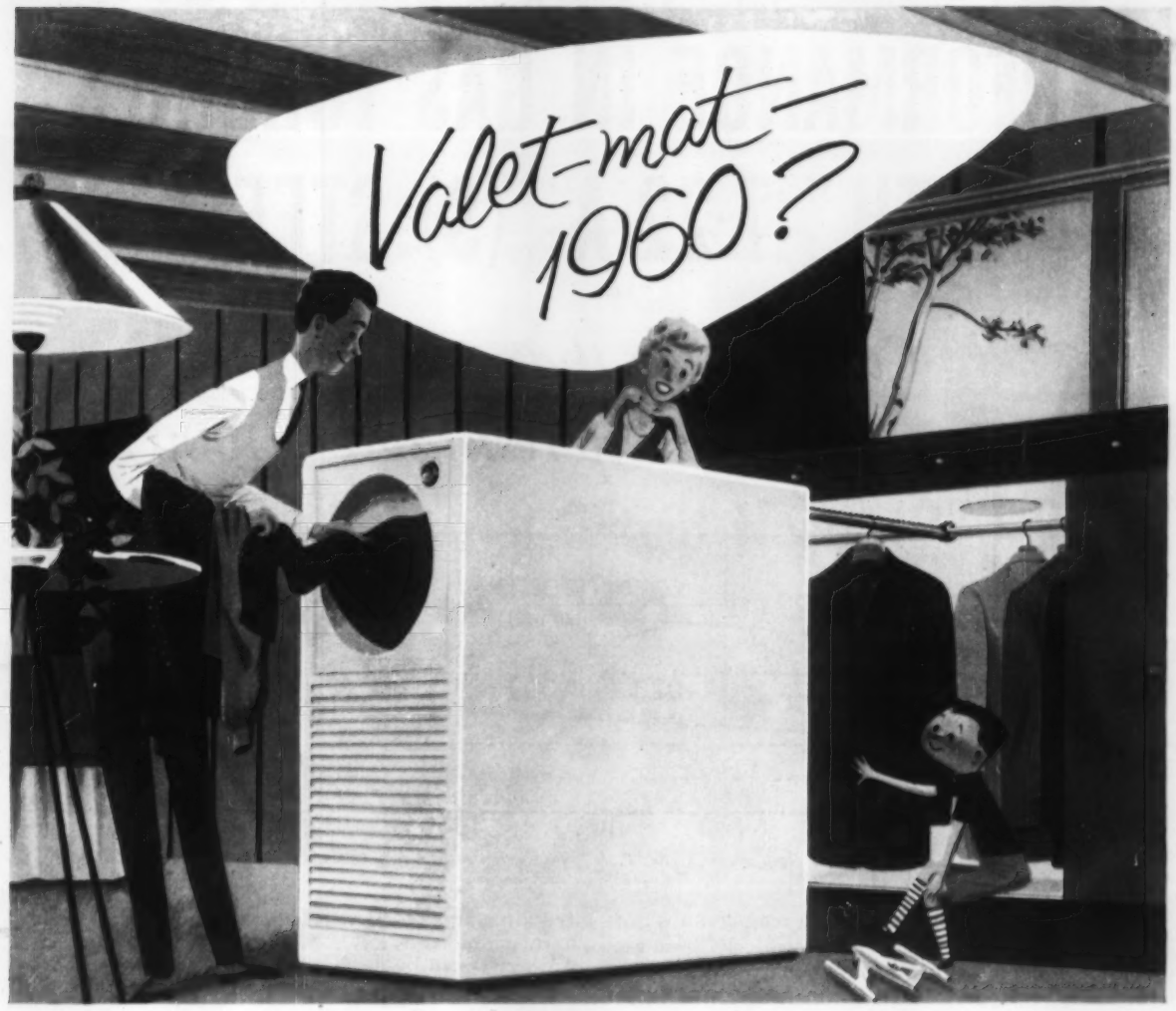
Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

Packard Division of Studebaker-Packard Corp. is on target for its goal of 100,000 cars a year, says James A. Nance, president. It is producing at a rate of more than 8000 cars a month. Dan O'Madigan, general sales manager, reports that the division is making progress toward its goal of recapturing its position in the luxury car market. More than 45 per cent of current output is in luxury models—a rate better than at any time since the early 1930s.

Other automakers are putting out signals of good times. American Motors plans to increase Rambler production by 60 per cent. Says Harlow H. Curtice of GM: "If current labor negotiations are concluded peacefully, this will be GM's biggest production and sales year. It could well be the best for the industry."

NEW DEPARTURES OF TOMORROW



Versatile, easy-to-operate machines that take the backache out of "ironing day" are a housewife's dream come true. And manufacturer after manufacturer has called on New Departure for its ball bearings.

It could well be that in less than a decade a compact new appliance for the home will clean and press a suit, coat or dress in seconds.

Of course, such a machine is yet to be developed. But one solid fact: when the "Valet-mat" does arrive, it will probably be New Departure ball bearings that keep it operating smoothly and efficiently.

Today, practically any type of home-service product you can name is New Departure-equipped. So, when your thoughts turn to new departures of tomorrow . . . think of New Departure—the company that makes the great forward strides in ball bearing design and manufacturing.

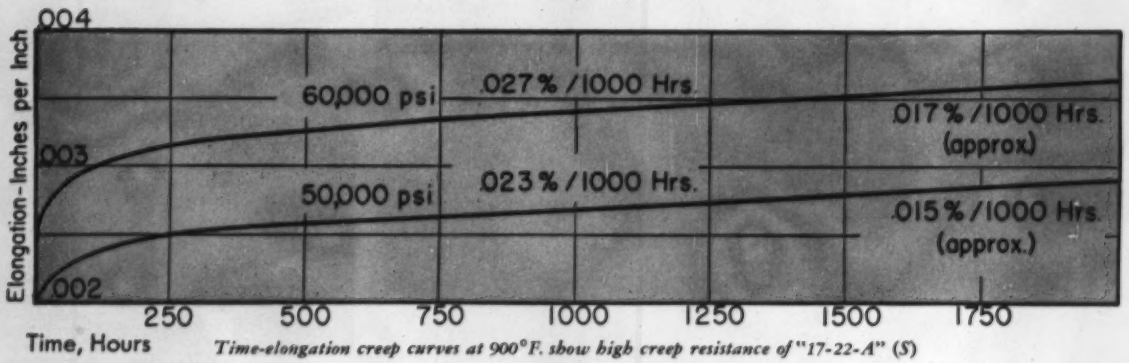
NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

NEW DEPARTURE
BALL BEARINGS
NOTHING ROLLS LIKE A BALL

SAVE ALLOYS, GET HIGH ALLOY PERFORMANCE IN GAS TURBINES WITH "17-22-A"® (S) STEEL

Contains less than 3% alloy

Gives maximum creep resistance to 1000°F.



Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)

IF your gas turbine parts operate at temperatures not exceeding 1000°F., you can save critical alloys, yet get high alloy performance by using "17-22-A"(S) steel produced by the Timken Company.

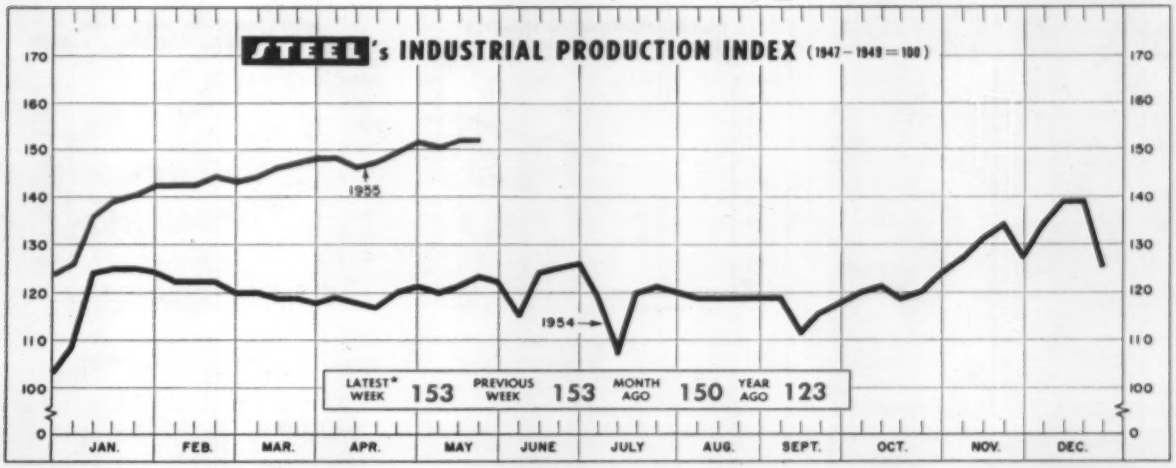
"17-22-A"(S) steel contains less than 3% alloy. It permits you to cut costs. Developed by metallurgists of the Timken Company, "17-22-A"(S) has been used successfully for 10 years in refinery and steam power applications. The graph above shows its creep resistance at 900°F.

"17-22-A"(S) also resists heat checking and thermal cracking. It is readily workable up to 2300°F. It's easy to machine and weld. Maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking.

For complete information on "17-22-A"(S), and its companion analysis, "17-22-A"(V)—used at temperatures up to 1100°F.—write for Technical Bulletin Number 36A. And for help with your high temperature problem, call upon our Technical Staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended May 21. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Expanding Industrial Output Nears 1953 Peaks

AN ALL-TIME HIGH in industrial production may be set in May. The merry month traditionally records a near-high in output for the year and 1955 should be no exception.

Here's why: Production in April was less than 1 per cent below the all-time high of 137 (1947-1949=100) as measured by the Federal Reserve Board's seasonally adjusted industrial production index.

Climbing—Since that measurement, steel production has continued to climb, auto outturn has remained strong and both consumer and producer durable goods have pretty much held their own or even made further gains.

All in all, it should add up to enough push to at least tie the record set in May and July of 1953, with chances good that the mark will be surpassed.

Building—The FRB's report of April business conditions showed another workhorse of the economy in continuing good shape. Outlays for new construction hit a new high on the coattails of gains in private residential building.

Housing starts of 127,000 were 18 per cent above the same month of 1954. This year's rise was less than seasonal, but that's often the case during periods of high housing activity, the Labor department points out.

Outlook—The outlook is for the heavy construction boom to go on. Awards of $476 million were posted in the latest week reported by *Engineering News-Record*, the second biggest weekly volume so far in 1955. It brings the 20-week total to an all-time high of $7.1 billion.

This year's contract volume is now 41 per cent above last year and 18 per cent higher than the previous record of 1953.

Confidence—Particularly encouraging is the fast pace of industrial building, a sure sign of business confidence. Awards so far this year are $974.1 million, a record volume for industrial contracts in peacetime. Now 31 per cent above last year, industrial awards are ex-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,324	2,338	1,698
Electric Power Distributed (million kw-hr)	9,700[1]	9,673	8,373
Bitum. Coal Output (1000 tons)	8,925	8,690	7,149
Petroleum Production (daily avg—1000 bbl)	6,678[1]	6,681	6,435
Construction Volume (*ENR*—millions)	$475.7	$458.7	$330.4
Automobile, Truck Output (*Ward's*—units)	218,972	221,746	158,023
TRADE			
Freight Car Loadings (1000 cars)	760[1]	757	682
Business Failures (Dun & Bradstreet, no.)	225[1]	233	248
Currency in Circulation (millions)[3]	$29,877	$29,859	$29,707
Dept. Store Sales (changes from year ago)[3]	+11%	+9%	−8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,769	$18,803	$21,467
Federal Gross Debt (billions)	$277.3	$276.6	$273.2
Bond Volume, NYSE (millions)	$18.1	$17.8	$20.8
Stocks Sales, NYSE (thousands of shares)	10,690	11,042	11,151
Loans and Investments (billions)[4]	$84.2	$84.5	$79.7
U. S. Govt. Obligations Held (billions)[4]	$33.4	$33.6	$32.0
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	237.1	237.0	212.6
All Commodities[7]	110.3	110.4	111.3
Commodities Other Than Farm & Foods[7]	115.7	115.7	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

LIFE STEPS UP AT 40!

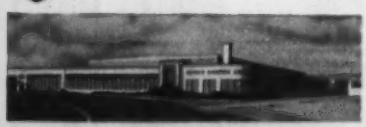
1915 – 1955
FORTY DE·STA·CO YEARS
QUALITY STAMPINGS

Sure we've been making stampings for 40 years! . . . But we're going up the hill faster than ever!

Expanded facilities! . . . Newer equipment! . . . Wider diversification! . . . Even more customers—and from every major industry!

The mere fact that we're the nation's best-known job stamping manufacturer . . . shows how we've progressed.

Now . . . as our life steps up at 40 . . . would be a good time to let us do a bang-up job for you, too!



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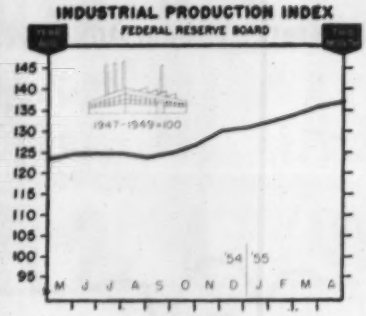
359 Midland Ave., Detroit 3, Mich.
America's Best-Known Job Stamping Manufacturer

THE BUSINESS TREND

INDUSTRIAL PRODUCTION INDEX
FEDERAL RESERVE BOARD

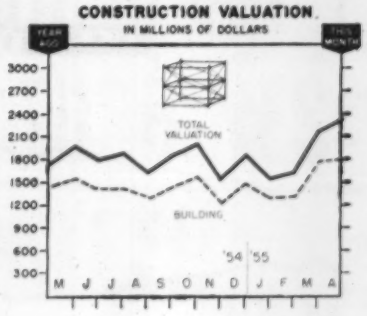


(seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1955	1954	1955	1954	1955	1954
Jan.	131	125	127	111	156	155
Feb.	133	124	131	108	157	152
Mar.	135	123	135	103	158	148
Apr.	136*	123	139*	104	160*	146
May	...	124	...	106	...	147
June	...	124	...	108	...	145
July	...	124	...	104	...	148
Aug.	...	123	...	106	...	148
Sept.	...	124	...	117	...	148
Oct.	...	126	...	110	...	149
Nov.	...	129	...	118	...	155
Dec.	...	130	...	120	...	156
Avg	...	125	...	110	...	150

Federal Reserve Board. *Preliminary.
Charts Copyrighted, 1955, STEEL.

CONSTRUCTION VALUATION
IN MILLIONS OF DOLLARS



37 States

	Total		Building	
	1955	1954	1955	1954
Jan.	1,504.5	1,151.9	1,256.1	935.6
Feb.	1,581.1	1,221.3	1,278.6	977.5
Mar.	2,134.8	1,527.5	1,748.6	1,199.8
Apr.	2,322.1	1,691.9	1,776.1	1,401.6
May	.....	1,925.3	.....	1,497.6
June	.....	1,733.3	.....	1,376.7
July	.....	1,836.9	.....	1,386.9
Aug.	.....	1,572.9	.....	1,243.3
Sept.	.....	1,816.2	.....	1,424.2
Oct.	.....	1,965.3	.....	1,522.8
Nov.	.....	1,498.9	.....	1,199.8
Dec.	.....	1,828.8	.....	1,463.0
Total	.....	19,770.2	.....	15,628.8

F. W. Dodge Corp.

pected to continue upward because of the large number of new plants proposed during the last 16 months and especially in the last four months.

Long-range prospects for the construction industry also are bright. More than $200 billion in new construction will be needed in the next ten years to meet the requirements for nonfederal public works.

Plans for Building Lag . . .

The Labor and Commerce departments say we'll require an annual expenditure of $20 billion until 1965 if estimated needs are to be filled. A record $8.6 billion was spent for such construction in 1954. In terms of 1954 costs, the estimated 1955-1964 outlay is equal to more than four times the cost of such facilities built in the last ten years. The departments point out that this spending should be accomplished on schedule or else we'll be hopelessly behind after 1965. In the decade starting that year, needs for community facilities will rise even more because of population gains.

Over the next decade, state and local governments should spend, according to the departments, $92 billion for highways, $41.5 billion for educational buildings, $22 billion for hospital and institutional structures, $25.3 billion for water and sewerage works and $23.2 billion for other public works.

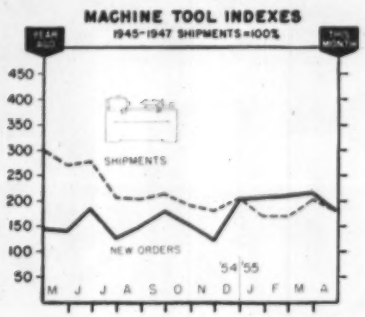
The hitch is that state and local government planners aren't in step with the federal government estimators. Total work in preparation would cost about $25.3 billion, little more than the estimated $20 billion required for each of the coming years of the decade. And only a third of those projects are in or past the drawing board stage.

Autos Set for Slide . . .

Fast-paced auto production is slated for a 20-per-cent drop in the third quarter. With possible labor troubles taken into account, the rate may drop off even more.

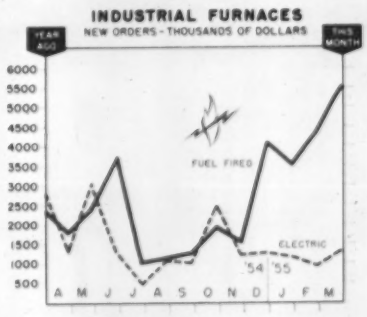
In the meantime, though, more than 3 million cars have been sold this year, with the auto companies putting on sales contests to further heat up the already torrid pace.

Model changeover already is in the wind, with the first coming next month, according to *Ward's Automotive Reports*. July and August will see seven makes shut down. Three more will make the switch in September, with the rest



	New Orders		Shipments	
	1955	1954	1955	1954
Jan.	206.0	173.5	167.3	319.4
Feb.	209.4	159.8	168.2	323.1
Mar.	214.6	169.6	202.5	327.2
Apr.	180.8*	142.8	180.8*	302.7
May	....	139.5	....	270.3
June	....	185.2	....	276.3
July	....	124.7	....	205.7
Aug.	....	147.9	....	203.7
Sept.	....	180.9	....	213.4
Oct.	....	148.9	....	191.0
Nov.	....	119.5	....	179.5
Dec.	....	202.9	....	203.4

*Preliminary.
National Machine Tool Builders' Assn.



	Fuel Fired*		Electric	
	1955	1954	1955	1954
Jan.	3,545	1,865	1,177	1,374
Feb.	4,390	1,758	981	1,093
Mar.	5,612	2,346	1,346	2,828
Apr.	....	1,734	....	1,262
May	....	2,423	....	3,095
June	....	3,724	....	1,261
July	....	987	....	456
Aug.	....	1,117	....	1,052
Sept.	....	1,241	....	1,007
Oct.	....	1,950	....	2,496
Nov.	....	1,534	....	1,196
Dec.	....	4,111	....	1,265

*Except for hot rolling steel.
Industrial Heating Equipment Assn. Inc.

holding off till October or even later.

The high level of industrial production is making itself felt on the employment situation. Nonfarm employment was 48.8 million in April, says the Federal Reserve Board; a sharp gain in factory employment was the chief factor in the rise.

On the other hand, the workweek declined by half an hour to 40.2 hours, about usual for that time of year. Average hourly earnings at factories rose 1 per cent to a new high of $1.86, but weekly earnings dropped off some because of the shorter workweek.

Unemployment declined by 200,000 leaving the total unemployed under 3 million—about 500,000 fewer than a year ago. Unemployment will probably increase again in June as students enter the labor market.

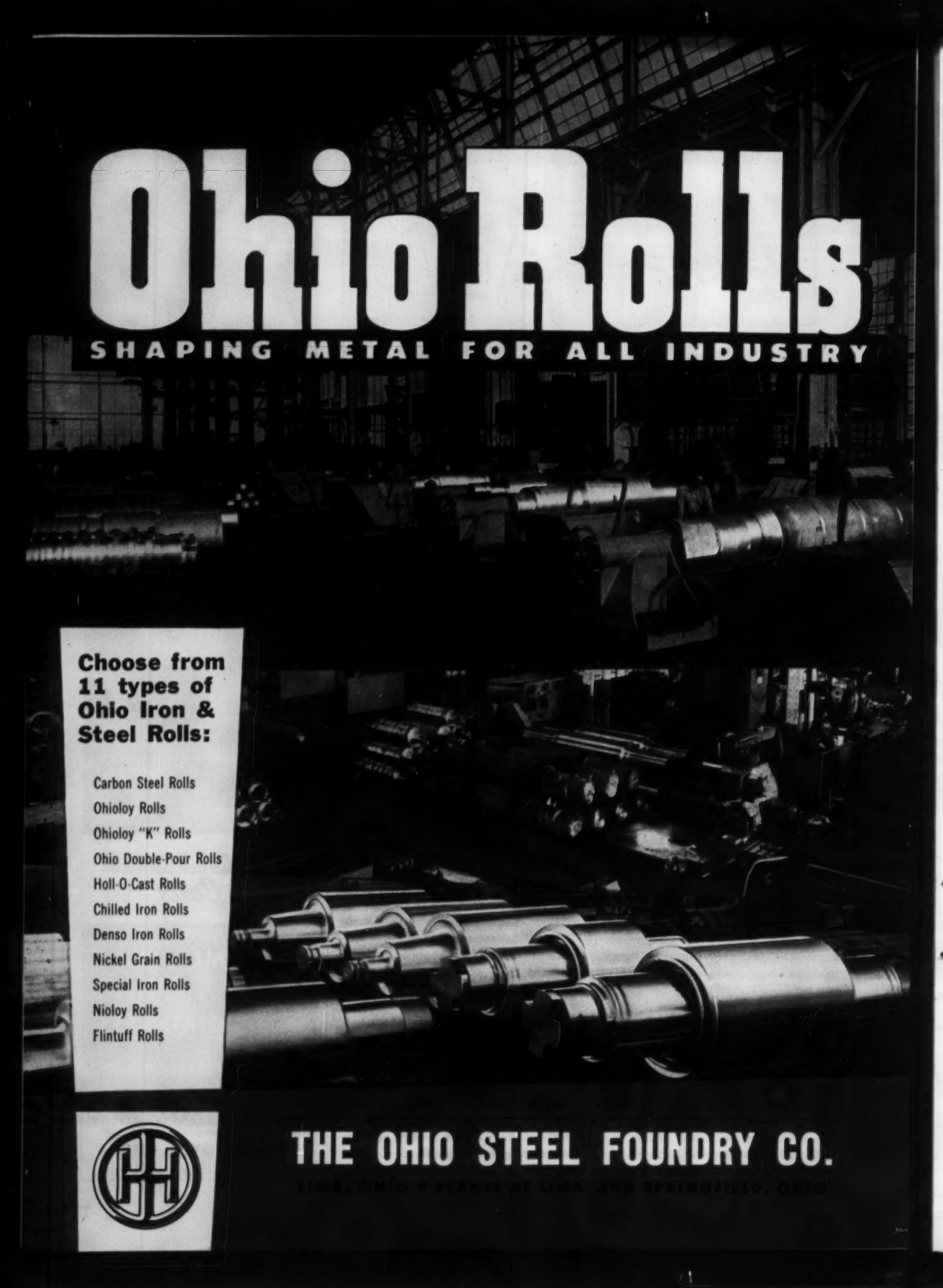
Freight Car Orders Up . . .

A glimmering of improvement in railway equipment orders showed up last month. Orders for 2706 freight cars were almost triple those of the same month last year. But deliveries outpaced orders, so backlog took a small drop to 17,930 from 17,974 a month earlier, according to American Railway Car Institute.

Dropping backlogs also were the case for locomotives—360 as of May 1, against 428 a month earlier. Part of the drop was due to higher deliveries—107 in April, compared with 85 in March. Still the backlog is higher than a year ago when only 300 were on order.

Trends Fore and Aft . . .

"The electronics industry probably will double in size in the next seven or eight years to rival the automobile industry in the value of its output," states Julian K. Sprague, president, Sprague Electric Co., North Adams, Mass. One reason: Automation . . . The year 1955 will prove one of the most successful in Merritt-Chapman & Scott Corp.'s 95-year history, predicts Louis Wolfson, chairman and president. . .New order index of American Supply & Machinery Manufacturers Association Inc. was 173.74 in April, off slightly from March's 186.88 (July 1948=100) but still the second-best month since early 1953. . .New business incorporations in the first four months of 1955 are highest on record for the period, reports Dun & Bradstreet Inc.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SHAPING METAL FOR ALL INDUSTRY
Choose from 11 types of Ohio Iron & Steel Rolls:
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Ohio Double-Pour Rolls
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Chilled Iron Rolls
Denso Iron Rolls
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Special Iron Rolls
Nioloy Rolls
Flintuff Rolls
THE OHIO STEEL FOUNDRY CO.

JAMES J. REYNOLDS
. . . Alco Products v.p.-operations

ALEXANDER ZEITLIN
. . . Birdsboro Steel v.p.

CHARLES G. BEAVERS JR.
. . . Follansbee Metals president

James J. Reynolds was named vice president-operations, **Alco Products Inc.**, Schenectady, N. Y. He was vice president of industrial relations. He now is in charge of manufacturing, procurement and material control operations, as well as employee and industrial relations.

Frank W. Fink joined **Ryan Aeronautical Co.**, San Diego, Calif., as vice president and chief engineer. He was for many years chief engineer of the San Diego division of Convair, division of General Dynamics Corp.

Ralph L. Bayless was made chief engineer of **Convair's** San Diego, Calif., division, General Dynamics Corp. He was assistant chief engineer.

George Pinkus was elected president, **Great Lakes Stamping & Mfg. Co.**, Toledo, O. He was executive vice president. **B. J. Secor** and **A. R. Pass** were made vice presidents.

Beals, McCarthy & Rogers Inc., Buffalo, appointed **Robert E. Mills** purchasing agent; **Carl W. Gregory**, comptroller.

Tinius Olsen II was elected president, **Tinius Olsen Testing Machine Co.**, Willow Grove, Pa., to succeed his father, **Thorsten Y. Olsen**, now board chairman.

Alexander Zeitlin was elected vice president, **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa. He continues as president of Engineering Supervision Co., New York, recently acquired by Birdsboro. For the last six years, Mr. Zeitlin was vice president-general manager of Loewy Construction Co. and vice president of its parent company, Hydropress Inc.

Ernest C. Kron, steel metallurgist for **Doehler-Jarvis Division**, National Lead Co., Toledo, O., was promoted to division metallurgist. He succeeds **J. C. Fox**, resigned.

Leo J. McPharlin was made purchasing agent for **Chrysler Corp.'s** automotive body division, Detroit.

Paul C. Kreuch was elected a vice president, meter and valve division, **Rockwell Mfg. Co.**, Pittsburgh. **Eugene F. Foubert** was elected vice president-industrial relations.

Plomb Tool Co. appointed **G. E. Jones** vice president and manager of its Proto Tools Division, Jamestown, N. Y. He replaces **Claude Boring**, resigned.

Harold B. Emerick was named director of the technical services division, **Jones & Laughlin Steel Corp.**, Pittsburgh. He succeeds **D. T. Rogers**, now manager-cold finished products, a division of the sales department.

Charles G. Beavers Jr. was elected president, **Follansbee Metals Inc.**, Wallingford, Conn. He succeeds **Frederick W. Richmond**, now board chairman. Mr. Beavers was president of Brubaker Tool Corp.

Price Berrien, general plant manager, was made works manager of **National Screw & Mfg. Co.**, Cleveland. He is in charge of manufacturing and plant operation. **J. Robinson Hyde**, production manager, was promoted to director of sales research and is succeeded by **Clayton J. Cross. Howard L. Hopkins**, chief metallurgist, was promoted to chief engineer in charge of production engineering. **Albert J. Parker** was made chief products engineer, in charge of development and research on tools and new equipment.

Climax Molybdenum Co. appointed **John F. Robb** head of steel industry sales; **Vernon H. Patterson**, manager of foundry sales. Mr. Robb has headquarters in Pittsburgh; Mr. Patterson, in New York.

Rapid Electric Co., New York, appointed **William E. Bryan** director of sales; **Eugene A. Cooney**, director of purchases. Mr. Bryan was with American Machine & Metals Inc. Mr. Cooney was with S. Alexander Co.

Paul A. Peters was made purchasing agent and **Ellis Griffiths** gen-

GEORGE A. LYON JR.
. . . Lyon Inc. president

GLENN KOGER
. . . v.p. of Rome Cable Corp.

HENRY R. MERRILL
. . . Behr-Manning gen. sales mgr.

eral superintendent of the Catasauqua, Pa., plant of **Phoenix Mfg. Co.**

George A. Lyon Jr. was elected president, **Lyon Inc.**, Detroit, to succeed his father, **G. Albert Lyon Sr.**, now board chairman.

William E. Liesman was made assistant sales manager, **Parish Pressed Steel Division**, Dana Corp., Reading, Pa.

E. Horton & Son Co., Windsor Locks, Conn., elected **Douglas H. Thomson** president to succeed **Robert S. Cooper**, resigned. Mr. Thomson was vice president and secretary. Named to fill vacancies on the board: **George S. Chiaramonte**, general sales manager; and **Philip T. Sherman**, treasurer and comptroller. **Mary A. Caffrey** is secretary.

Herschel V. Hiatt was made works manager of **Highway Trailer Co.**, Edgerton, Wis. He was previously with Le Roi Co.

William M. Schmidt was made vice president and director of styling for **Studebaker-Packard Corp.**, Detroit. **Clarence H. Smith** was made Studebaker works manager, in charge of manufacturing operations in all South Bend, Ind., and Los Angeles plants.

Robert P. Tibolt was made executive vice president and **Allan C. Johnson** an assistant vice president, **Eastern Gas & Fuel Associates**, Boston.

Rome Cable Corp., Rome, N. Y., elected **Glenn Koger** a vice president. He continues to serve as manager of the Torrance, Calif., plant.

William E. Van Horne was made assistant sales manager, **Industrial Nucleonics Corp.**, Columbus, O.

Alfred T. Blackburn and **E. D. Vancil** were elected vice presidents and directors of **Cincinnati Milling & Grinding Machines Inc.**, Cincinnati, sales organization of Cincinnati Milling Machine Co. Both previously served with the parent company.

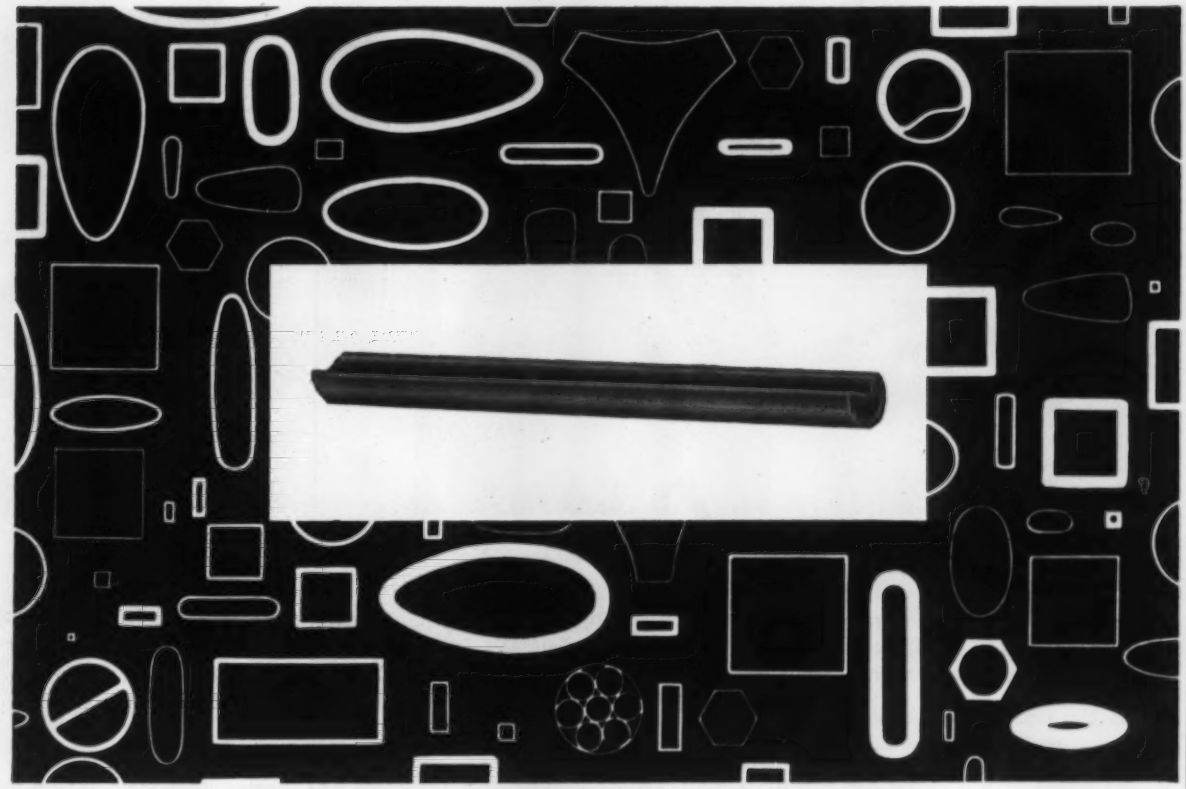
Henry R. Merrill was made general sales manager, **Behr-Manning Division**, Norton Co., Troy, N. Y. A director of Behr-Manning and its assistant general sales manager for the last two years, he succeeds the late **John M. Cook.**

H. H. Bloom, president of **Massey-Harris-Ferguson Inc.**, Racine, Wis., and first vice president of Massey-Harris-Ferguson Ltd., Toronto, Ont., assumes over-all supervision of North American operations. **C. P. Milne**, executive vice president, assumes active management at Racine. **G. H. Thomas**, vice president - administration, transfers to

ALFRED T. BLACKBURN

E. D. VANCIL

. . . Cincinnati Milling & Grinding Machines' vice presidents



A few of the shapes available from SUPERIOR in standard specifications and tolerances or to your own design. The tube in the foreground is a gun drill shank made from 4130 alloy steel.

Save time and money on special shaped tubing

"SUPERIOR" TUBING IS IMMEDIATELY AVAILABLE IN A WIDE RANGE OF SHAPES, FORMS, ALLOYS

Many manufacturers have discovered that SUPERIOR's ability to supply as standard what many firms consider specialty tubing saves them trouble, time and money. SUPERIOR makes round, square, oval, rectangular, elliptical and flat oval tubing, for instance. It makes capillary tubing, pointer tubing, electronic tubing, telescopic sizes, large OD-light wall tubing. Over 55 analyses are available in carbon, alloy and stainless steels; in nickel and nickel alloys; in beryllium copper, titanium, zirconium.

The gun drill shank shown above and on the right is a good example of SUPERIOR's ability to supply unusual shapes. This newly rediscovered method of producing close-tolerance high-finish holes demands straight, rigid, accurate shanks with a 110° V-groove. SUPERIOR can produce such a shape—and others—in a fraction of the time and cost it would take a customer to form his own.

If you're having difficulty getting the kind of tubing you want, SUPERIOR can undoubtedly help you. Write for your free copy of Bulletin 40—*A Guide to the Selection and Application of Superior Tubing*. SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif.

Turks-head rollers converting a round section of SUPERIOR tubing into the typical elliptical shape for a Bourdon gage tube.

Gun drills can produce holes from 4 to 230 diameters or more in 4 times the speed of conventional drilling methods or better. Holes so produced are straight and round to tolerances of 0.0002" or less and wall finishes are 7 mu-in or better.

All analyses available in .010" to ⅛" OD; certain analyses in light walls up to 2½" OD

Superior Tube

The big name in small tubing

H. D. McLEESE
. . . Metal & Thermit gen. sales mgr.

WILLIAM T. SUGGS
. . . heads White Metal can division

EDWARD D. JACKSON
. . . Axelson Mfg. gen. sales mgr.

Toronto as vice president-general manager. **Lee J. Wolf** becomes vice president-administration.

H. D. McLeese was made general sales manager and **Dr. J. E. Stareck** director of research for **Metal & Thermit Corp.**, New York, and its subsidiary, **United Chromium Inc.**

Donald L. Rossiter was made vice president-general sales manager, **Inland Steel Products Co.**, Milwaukee. He was assistant general sales manager, engineering products. New assistant general sales managers are: **Gordon Matthews**, merchandising and product planning; **M. P. Komar**, field sales; and **J. D. Ray**, administrative sales services.

Pascal M. Rapier was made process engineer at the Clark, Nev., plant of **Eagle-Picher Co.**

W. J. Darragh was made New England district manager for **General Controls Co.**

White Metal Mfg. Co., Hoboken, N. J., named **William T. Suggs** manager of its new can division. It will manufacture aluminum cans for electrolytic condensers and capacitors, as well as other impact extrusions.

Officers for **National-U. S. Radiator Corp.**, Johnstown, Pa., are announced by **Theodore B. Focke**, president: **Carroll M. Baumgardner** is senior vice president-sales; **Louis N. Hunter**, senior vice president-engineering and research; and **Howard B. Steggall**, senior vice president - manufacturing. Vice presidents are: **John C. Haas** and **F. M. Swartz**, manufacturing; **Edmond J. Grady**, Pacific Steel Boiler Division; **Marion I. Levy**, Viking Division; and **J. Roy Knox**, heating and air conditioning division.

Henry Chisholm Jr. was made an assistant district sales manager at Cleveland for **Republic Steel Corp.** He succeeds **Nelson E. Walker**, Pittsburgh sales manager.

Edward D. Jackson was made general sales manager, **Axelson Mfg. Co.**, division of U. S. Industries Inc., Los Angeles. He was vice president-sales and a director of Toledo Scale Co.

H. K. Porter Company Inc. appointed **H. A. Wiley Jr.** manager, belting and packing sales, Quaker Pioneer Rubber Mills Division, San Francisco; **J. T. Black**, general superintendent, Connors Steel Division plant, Birmingham; and **Ted W. Peterson**, Chicago district sales representative, Leschen Wire Rope Division.

Harry Cubel was made manager, chain saw sales, **Atkins Saw Division**, Borg-Warner Corp., Indianapolis.

Dr. E. H. Seymour was made chief engineer, **Thermal Research & Engineering Corp.**, Conshohocken, Pa.

G. E. Shuttleworth was made sales manager, post division, **Buffalo Steel Corp.**, Tonawanda, N. Y.

OBITUARIES...

Charles J. Tuckley, 72, director of sales, **Guibert Steel Co.**, Pittsburgh, died May 4.

Ralph Van Deventer, 74, chairman of **Link Steel Co.**, Pasadena, Calif., died May 10.

Frank C. Smith, 60, chief metallurgical engineer for **Bethlehem Pacific Coast Steel Corp.**, San Francisco, died May 6.

Frank A. Backman, 53, assistant to the vice president and general manager, **Kaiser Engineers Division**, Henry J. Kaiser Co., Oakland, Calif., died May 12.

Channing Allen, 46, sales executive, **International Business Machines Corp.**, New York, died May 17.

Elmer A. Rich Jr., 67, former executive of **American Foundry Equipment Co.**, Mishawaka, Ind., died May 11.

Charles D. Wiman, 63, president, **Deere & Co.**, Moline, Ill., died May 12.

B. M. Livezey, 61, former general superintendent, S. Chicago Works, **U. S. Steel Corp.**, died May 10.

8:30 A.M.—GARAGE. A lucky fellow, John rides to work every day in his car. This is his garage. Notice that it has a smooth-operating overhead door. What makes it swing up? A large spring. And—you guessed it—it's made from CF&I-Wickwire Wire.

8:35 A.M.—AUTOMOBILE. CF&I-Wickwire Wire contributes much to the comfort and efficiency John gets from his car. There's wire in the springs of the seat and back cushions. Also under the hood in the valve springs and the starter spring.

ROUND THE CLOCK *with*

CF&I-WICKWIRE WIRE

8:45 A.M.—HIGHWAY. Notice the ribbon of concrete over which John's car rides smoothly to its destination. Many people, just like John, fail to realize that what holds it together is Welded Wire Reinforcement Fabric—another of the products that use CF&I-Wickwire Wire.

FOR THE WIRE YOU REQUIRE
CHECK CF&I-WICKWIRE

Watch for the balance of John's day in succeeding advertisements that take him to his office, through his plant and finally home to his living room.

CF&I-WICKWIRE WIRE

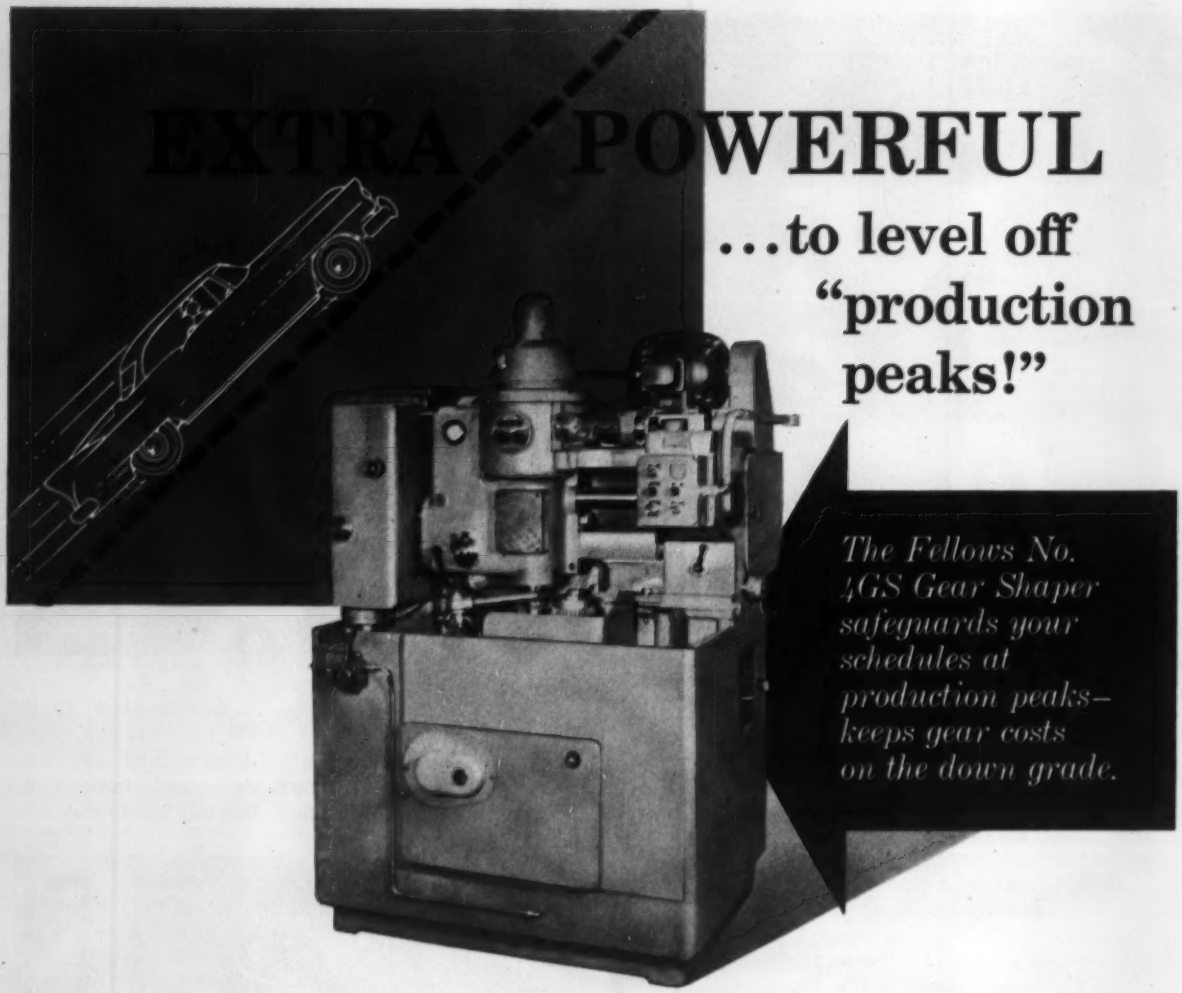
THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

2847 THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

EXTRA POWERFUL

...to level off "production peaks!"



The Fellows No. 4GS Gear Shaper safeguards your schedules at production peaks—keeps gear costs on the down grade.

Just as you can rely on the extra horsepower in your car when the going gets tough...you can rely on the modern, powerful machine tool to carry your production over peak periods when the schedules are tight.

The All-New Fellows No. 4GS is a powerful, rigidly constructed machine tool that can remove stock FAST...finish-cut gears more rapidly and within closer tolerances than ever before.

Features rugged drive mechanism to match its 3⅜" cutter spindle! Reciprocating cutter speeds from 98 to 635 strokes per minute! Rotary feeds from 0.008" to 0.024" based upon 4" p.d. cutter! Ideally suited for automatic loading and unloading in the smaller size range...complete production cycle! CAPACITY: 6" p.d. x 2" face!

Contact
any Fellows Office for complete machine data and information about the Fellows Plan for deferred payment!

THE Fellows GEAR SHAPER COMPANY

Head Office and Export Dept., 78 River St., Springfield, Vt.

Branch Offices: 319 Fisher Bldg., Detroit 2, Michigan • 5835 West North Avenue, Chicago 39, Illinois
2206 Empire State Bldg., New York 1, N. Y. • 6214 West Manchester Avenue, Los Angeles 45, California

Adds Tin Plate Facilities

No. 2 tin mill at Indiana Harbor, Ind., will double Youngstown Sheet & Tube's capacity

A SEVEN-BUILDING tin mill is under construction at Youngstown Sheet & Tube Co.'s Indiana Harbor (Ind.) Works. To be completed between August and November, 1956, the No. 2 mill will double the Youngstown firm's electrolytic tin plate output.

Steel for processing through the mill will come from the present tin mill and cold-reduced sheet mill.

Why—The company is increasing its tin plate facilities in the Chicago district to satisfy growing demand from consumers in the north-central states. This district accounts for more than one-third of electrolytic tin plate used in the U. S. Over 34 billion tin cans were produced in the nation last year.

Special Coating—The new mill will produce tin plate with various coatings, including one type with a light coating on one side and a heavy coating on the other.

A feature will be a 4-high, 2-stand temper mill with a capacity speed of more than a mile a minute. The temper mill flattens and hardens the steel after it is annealed.

Fabricators May Merge

R. C. Ingersoll, president of Borg-Warner Corp., Chicago, and E. S. Dulin, president of Byron Jackson Co., Los Angeles, will recommend merger of their companies to their directors. Borg-Warner makes automotive, aircraft and agricultural implement parts and household appliances. Byron Jackson makes centrifugal pumps, oil field tools (and services), electronic devices and nuclear power components.

Buys Pittsburgh Property

Continental Foundry & Machine Co., East Chicago, Ind., purchased a 14-story building and an adjoining 4-story building at 14 Wood St., Pittsburgh. Continental will consolidate its Pittsburgh activities in them when the transfer of property takes place in December. The company produces rolling mill machinery and auxiliary equipment; power house equipment; iron, alloy iron and steel roll mills; castings; and weldments.

Installs Furnace Brazing Unit

Fabriform Metal Products Division, George Getz Corp., Los Angeles, specialist in copper furnace brazing of metal parts, installed new furnace brazing equipment. Value: Over $100,000.

Builds Galvanizing Plant

National Galvanizing Co., Pittsburgh, is constructing a commercial hot-dip galvanizing plant on Neville Island, near Pittsburgh. The $300,000 plant is to be in operation in August. Production capacity will exceed 200 tons of fabricated steel a day.

Wickwire Buys Furnace

Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., Denver, awarded a contract to Gas Machinery Co., Cleveland, to furnish a 60-ton billet heating furnace for its River Road plant in Buffalo.

Salem-Brosius, Phillips Merge

Salem-Brosius Inc. and Phillips Corp., Pittsburgh, merged. Phillips will be operated as the Phillips Division of Salem-Brosius. John M. Phillips Jr. has been named vice president and assistant to the president of Salem-Brosius; James M. Phillips, manager, equipment sales. The two companies combined manufacturing operations at Carnegie, Pa., last year but maintained separate corporate identities. Salem - Brosius makes heating and heat-treating furnaces and special machinery for metal-producing and fabricating industries. Phillips makes materials handling equipment for the automotive and metalworking fields, industrial cars and coal mine equipment.

Vitro Rare Metals Expands

Vitro Rare Metals Co., a division of Vitro Corp. of America, New York, launched a modernization and expansion program which will cost more than $200,000 this year. Vitro Rare Metals refines and recovers rare metals for industrial and military uses and processes uranium-bearing residue materials for the Atomic Energy Commission.

Keep Polio Vaccine Pure

Processing vessels for the new polio vaccine were manufactured in record time. They help insure high standards of purity. Shown is part of a shipment of 104 vessels made with Allegheny Ludlum stainless steel by Nooter Corp., St. Louis. They are being used by a pharmaceutical manufacturer

Clary Multiplier Renamed

Clary Multiplier Corp., San Gabriel, Calif., changed its corporate name to Clary Corp.

Westco Steel Buys Plant

Westco Steel Co., Oakland, Calif., fabricator and industrial specialist, expanded facilities by acquiring the plant formerly occupied by Chicago Ornamental Iron Works, North Hollywood, Calif.

Sperry, Remington May Merge

Subject to approval by stockholders, Sperry Corp. and Remington Rand Inc., New York, will merge. Remington Rand's chief products and services include tabulating machines; electronic computers; adding, accounting and calculating machines; typewriters; systems equipment and supplies; library and museum equipment;

photographic records equipment; electric shavers. Sperry produces electronic, electromechanical and hydraulic devices; servomechanisms; gyroscopic instruments and related items; wire and wiring devices; machinery.

Acme Industrial Expands

Acme Industrial Co., Chicago, acquired and remodeled 38,000 sq ft of floor space to house screw machines, grinders, lapping, honing and automatic bench lathes. Heat treating equipment will be transferred from the main plant. The company makes tool room standards, machine shop aids and precision component parts for hydraulics and aircraft.

GE To Build in South

General Electric Co., Schenectady, N. Y., will build a plant at Irmo, near Columbia, S. C., to produce aluminum electrolytic capacitors. GE believes that rapid growth of color television will greatly expand the market for the product. The plant, including equipment, will cost about $6.4 million. Limited production is scheduled to begin early in 1956.

Flatware Producers Merge

R. Wallace & Sons Mfg. Co., Wallingford, Conn., producer of stainless and plated flatware, acquired Watson Co., Attleboro, Mass., manufacturer of sterling flatware and holloware. Operations will be continued at both plants.

Microcast Enlarges Facilities

Microcast Division of Austenal Laboratories Inc., New York, producer of investment castings, is expanding production facilities at its Rockaway township, New Jersey, plant. The building and equipment will cost about $600,000 and will increase production 37 per cent.

REPRESENTATIVES

Firth Sterling Inc., Pittsburgh, appointed these distributors: Tri-Tex Machine & Tool Co., Houston; Southwest Industrial Sales Co., Dallas; Christensen Machinery & Supply Co., Menominee, Mich.; Sanders & Lumberry Inc., Peoria, Ill.; Gary Mill Supply Co., Gary, Ind.; and Perine Machinery & Supply Co., Seattle and Spokane, Wash., and Portland, Oreg. Firth Sterling makes high-speed steels, tool and die steels and sintered tungsten carbides.

R. G. LeTourneau Inc., Longview, Tex., appointed Stanley E. Morris Co., Los Angeles, distributor of its electric hoists and jib cranes for southern California.

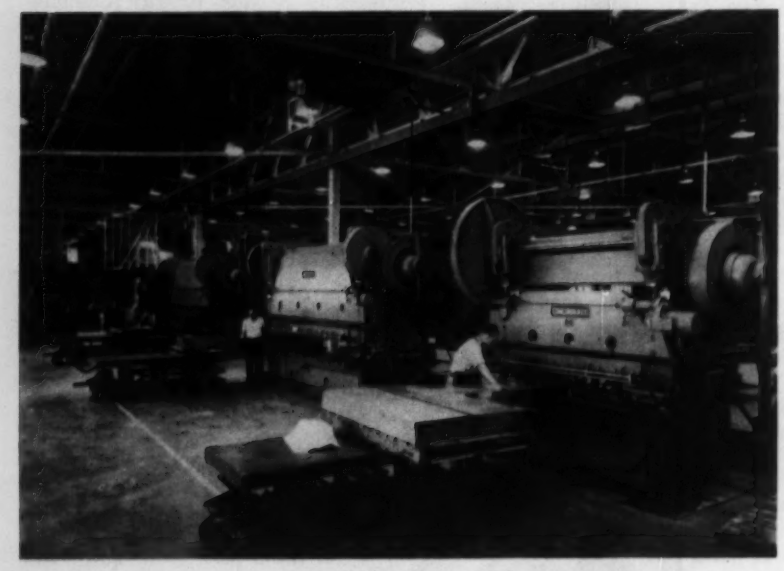
Tygart Steel Division of Alton Inc., McKeesport, Pa., has been appointed distributor for A. O. Smith Corp. and Harnischfeger Corp., both of Milwaukee. Addition of A. O. Smith safety steel grating and Harnischfeger welding rods and equipment to Tygart's present line of warehouse steel products is one of the first steps in a long-range expansion program.

Galion Allsteel Body Co., Galion, O., appointed Acme Spring & Equipment Co., Charleston, W. Va., distributor of its dump bodies and hydraulic hoists in central West Virginia. The distributor's territory previously was confined to Columbus and Portsmouth, O.

Micrometrical Mfg. Co., Ann Arbor, Mich., appointed the following representatives: Service Tool & Engineering Co., Minneapolis; Fuchs Machinery & Supply Co., Wichita, Kans., Joplin and Kansas City, Mo.; Marshall Supply & Equipment Co., Tulsa, Oklahoma City, Okla.; Stanco Co., Houston.

Hammel-Dahl Co., Providence, R. I., manufacturer of automatic control equipment, appointed Russell F. Clark Co., Pittsburgh, as its sales and service representative in that area.

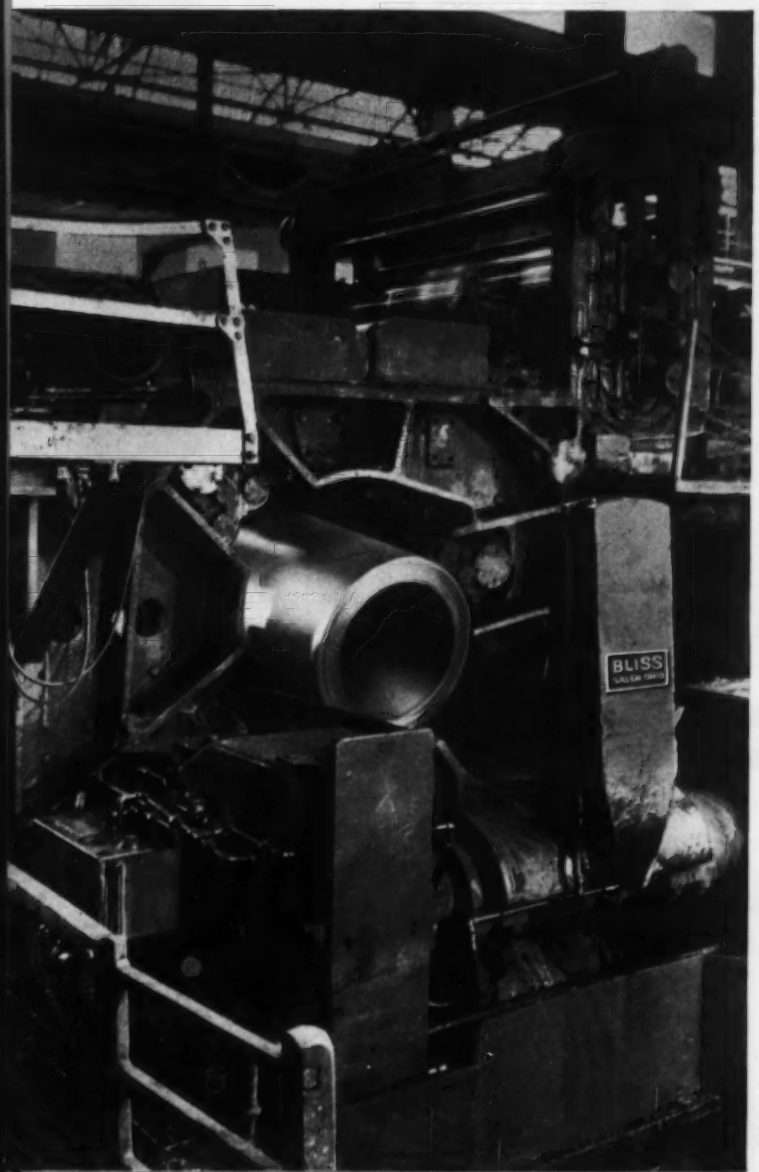
Illinois Precise Casting Co., Chicago, has been appointed as a licensee foundry by **Ampco Metal Inc.**, Milwaukee, and will produce only precision castings from Ampco Metal ingot by the lost-wax method. Ampco also appointed Giller Tool Supply Co. Inc., Dallas, and Mississippi Foundry & Machine Co. Inc., Jackson, Miss., as distributors of its safety tools; R. B. Carolin Foundry & Machine Co., Detroit, as distributor of its die blanks; and Bushnell Machinery Co., Pittsburgh, as distributor



Westinghouse Opens Air Conditioning Plant

Sheet steel is formed, trimmed or notched on these presses at Westinghouse Electric Corp.'s new air conditioning plant at Staunton, Va. Cabinet panels are formed in this section of the 276,120-sq-ft manufacturing area. One of the mobile hydraulic tables used to transport sheets from the shearing department is shown in the foreground. Presses range from 35 to 400 tons, with bed capacities up to 60 x 96 in. and brakes of ¼-in. x 12 ft, 240-ton capacity

At Great Lakes Steel, too—



A BLISS HOT MILL DOWNCOILER

This 28″ x 96″ Bliss hot mill downcoiler at the Great Lakes Steel Corp., Detroit Division of National Steel Corp., is but one of a number of downcoiler installations designed and built by Bliss since it pioneered the development of these expanding mandrel type downcoilers.

Similarly significant installations include Bliss coilers at U. S. Steel Company plants, and others at Ford Motor Company, Youngstown Sheet & Tube Company, Brazilian National Steel Company and August Thyssen Hutte A.G. (Western Germany).

While these coilers vary in size, the expanding mandrel feature, common to all, makes possible high-tension coiling—results in tightly wound, solid, smooth-edged coils. Moreover, the collapsible feature facilitates stripping of finished coils...eliminates surface damage.

For more complete information on these and other installations, write for a copy of our 60-page Rolling Mill Brochure, Catalog 40-A. It's yours for the asking.

E. W. BLISS COMPANY, General Office: Canton, Ohio
ROLLING MILL DIVISION: Salem, Ohio

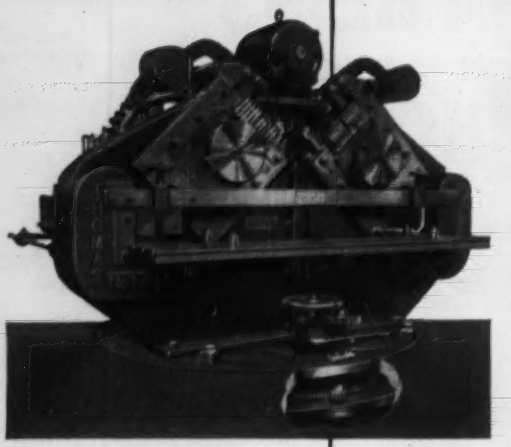
BLISS
SINCE 1857

is more than a name...it's a guarantee

PRESSES, ROLLING MILLS, SPECIAL MACHINERY
Plants: Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; San Jose, Calif.; Midland and Pittsburgh, Pa.

the trend is to THOMAS

double angle shears



The inbuilt quality and ruggedness of Thomas double angle shears insure years of trouble free service with a minimum of maintenance.

If you have a need for "high production" shearing of angles it will pay you to investigate Thomas.

Sizes are built for angles up to 8x8x1¼", with or without turn-table.

WRITE FOR BULLETIN 310-A

Punches • Shears • Presses
Spacing Tables • Benders

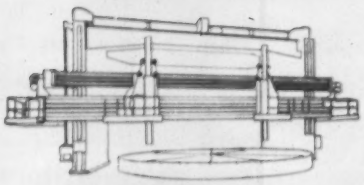
THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

62

LET SIMMONS REBUILD AND MODERNIZE YOUR BORING MILLS

Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1755 North Broadway, Albany 1, N. Y.



Write for Simmons Way... case histories of rebuilding jobs.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee... our standard since 1910

of its centrifugal pumps. Arizona Welding Equipment Co., Flagstaff, Ariz.; Pacific Metals Co. Ltd., with offices in San Francisco and Los Angeles; McDonald & Wilson Sales Co., St. Louis; Miller Equipment Co., Cincinnati; and Red Arrow Sales Corp., Madison, Wis., were named distributors of Ampco bronze welding rod.

ASSOCIATIONS

Officers of **American Foundrymen's Society**, Des Plaines, Ill., for 1955-56 are: President, Bruce L. Simpson, president, National Engineering Co., Chicago; vice president, Frank W. Shipley, foundry manager, Caterpillar Tractor Co., Peoria, Ill.

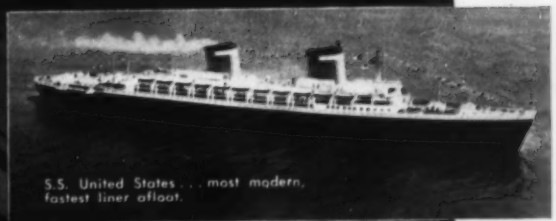
Austin R. Zender, executive vice president, Bridgeport Brass Co., Bridgeport, Conn., was elected president of the **Copper & Brass Research Association**, New York. T. E. Veltfort was re-elected manager.

The **Drop Forging Association**, Cleveland, elected to its board of directors Gordon R. Walker, president, Walker Forge Inc., Racine, Wis.; and Walter E. Lindell, president, Lindell Drop Forge Co., Lansing, Mich.

The Wire Reinforcement Institute Inc., Washington, elected R. H. Frizzell president. He is sales manager of the structural products department, Wickwire Spencer Steel Division, Buffalo, of Colorado Fuel & Iron Corp., Denver.

ANNIVERSARIES

Butterfield Division of Union Twist Drill Co., Rock Island, Que., and Derby Line, Vt., is celebrating its 75th year of operation. This plant is one of the pioneers of the metal cutting industry. It has expanded from handmade wagon wheel axle cutters to precision taps, dies, reamers, counterbores, drills and cutters. The plant is unique: Its buildings are divided by the international border.



S.S. United States . . . most modern, fastest liner afloat.

Nothing finer!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

You, too, *pay* for the best spring steel . . . make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 7, N. J.

ROEBLING

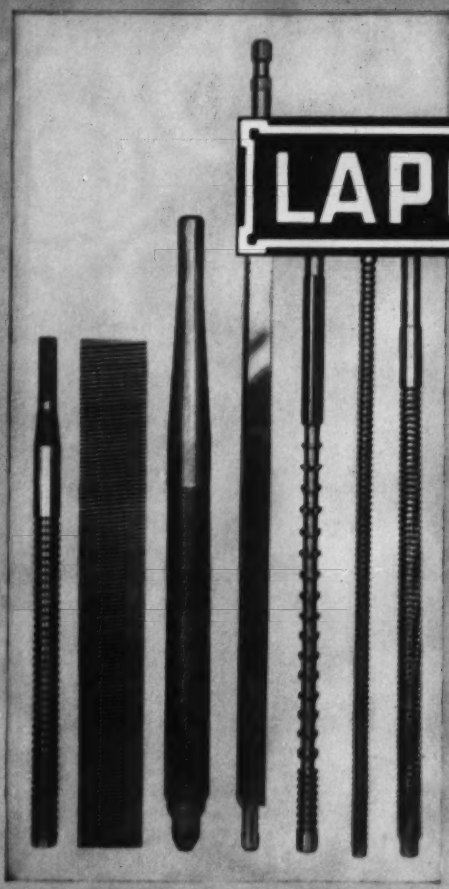
A subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

"A broach is a broach is a broach" ...or is it?

Even Gertrude Stein would never have said that, *if she had taken time to investigate the making of*

LAPOINTE BROACHES



Into these broaches goes all the engineering skill, the designing and manufacturing "know-how" of 53 years of broach-making. And not only do we produce the conventional types of surface and internal broaches, but we also get the *hard jobs,* the *really difficult ones!* We are the recognized headquarters, for example, for two extremely important types of broaches:

BROACHES for **involute gears** . . . in the automotive field

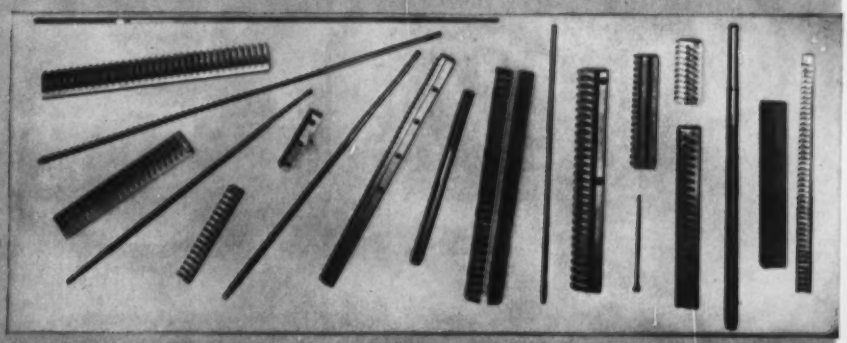
BROACHES for **jet engine "pine-tree" forms** . . . in the aircraft field

STEEL for all **LAPOINTE BROACHES** is produced under ideal conditions of quality control. Here's what we mean by that:

1. Steel for our broaches is poured to our own proven analysis.
2. Our heats are all poured special.
3. We control the steel all the way — from pouring through heat treating in our atmosphere-controlled electric furnace.

BUYERS OF BROACHES
should consult with us on all their broach problems, for broach grinding is an art — and it has been developed to the highest point of perfection at LAPOINTE.

CARBIDE-TOOTH BROACHES are now a real feature . . . made possible by the extremely high range of broaching speeds on modern Lapointe machines.



Electrolized **BROACHES,**
exclusive with Lapointe, increase life between grinds as much as 2 to 10 times!

THE LAPOINTE MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

STEEL
May 30, 1955

Technical Outlook

MINING CURRENT—Delegates to the American Mining Congress convention in Cleveland were told that alternating current systems are going to play a bigger role in underground operations. Initial cost of equipment is lower, and the problem of maintaining good voltage levels at working faces is greatly simplified. The highly portable transformers on the market today efficiently convert the alternating current to high voltage direct current which drives the machines. Another plus: Maintenance men are more easily trained to care for the alternating current equipment.

SPRAY-ON REFRACTORY—Coating permanent molds with aluminum or zirconium oxide refractory materials is just one application for the Flame Spray Ceramics process developed at Armour Research Foundation, Chicago. The coating is poorly wetted by certain molten metals, especially aluminum. Other predicted uses: Rockets, flame ducts, burner equipment, and as a liner for troughs, feeders, molds and other foundry equipment.

NUCLEAR BATTERIES—Strontium 90, a by-product of atomic bomb manufacture, is being used for the cores of miniature storage batteries less than ½-cu in. in size. The Signal Corps predicts they will be useful in electronic equipment using transistors.

SELECTIVE FILTERS—Metal powder filters wetted first with pure gasoline, will pass only gasoline from a gas-water mixture. If wetted first with water, they will pass only water. This selective principle, employed in automobile filters for several years, is being used in aircraft servo valves and jet fuel filters.

PINION RECORD—Over 3½-million tons of steel and 37 months of uninterrupted service. That record was made by the cast nickel, alloy steel pinions on the 43-in. blooming mill at U. S. Steel's Ohio works in Youngstown. It betters the former record seven times. Use of the wear-resistant alloy and improved heat treatment have produced superior shock resistance. Mackintosh-Hemphill was the supplier.

TIRELESS TIRES—Bus and truck tires have given up to 300,000 miles of service on the original treads. Steel wire imbedded in the rubber is responsible for such service, says Firestone Tire and Rubber Co.

TRAVELING TANKS—Tanks for a large plating machine at the Bayonne, N. J., laboratories of International Nickel Co. Inc. are built on skids. Instead of pumping solutions in and out, workmen simply shift tanks with a fork lift truck. The technique saves time and makes for a more versatile machine, says INCO.

STRONG IN SHEAR—Titanium aircraft bolts, which equal steel in shear strength and fatigue life, are being made by Standard Pressed Steel Co., Jenkintown, Pa. At $100 a pound they can still bring savings because of their weight advantage.

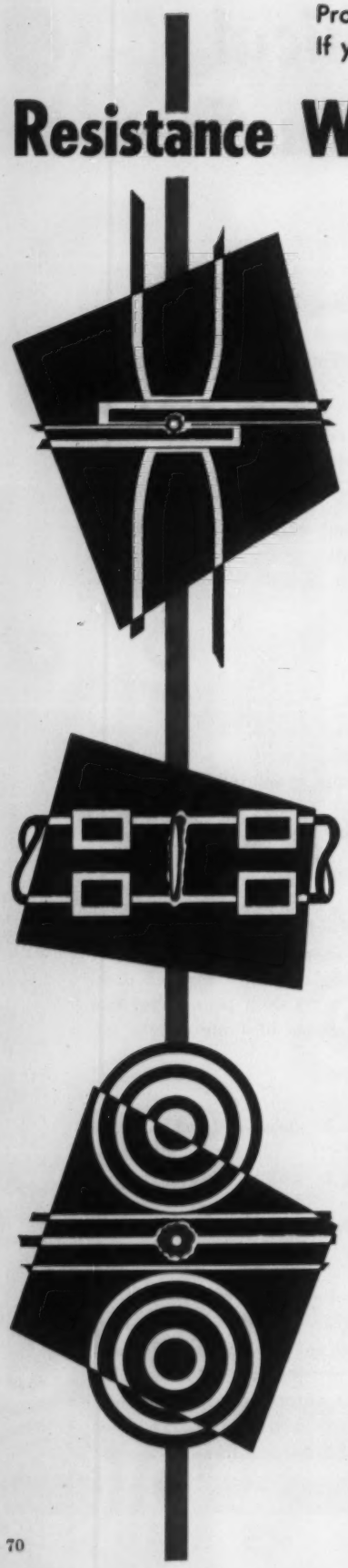
TUBING DEFECTS—A delayed shear - wave search unit is an effective ultrasonic means to spot internal defects in small diameter tubing for severe service use. Makers of heat exchangers, boiler tubes and atomic reactors will welcome it.

SELF-PORTRAIT—Make two fused materials or one component of an alloy radioactive and they will take their own pictures on x-ray film. The technique, called autoradiography, reveals how one metal diffuses into another, and how gases and sulphides diffuse in alloys.

Metalworking Outlook—p. 29 *Market Outlook—p. 93*

Profits are being strangled by high unit production costs. If you're trying to trim them . . .

Resistance Welding May Be the Answer



By THOMAS F. HRUBY
Associate Editor

THERE IS no middle ground in resistance welding.

If you can use it in your operations, it'll save its purchase price in a matter of months. But if it doesn't fit, no amount of trying will make it pay.

"And don't think that isn't a hard thing to say to a prospective customer who is sold," lamented a salesman for one of the top equipment manufacturers.

Who Needs It?—This much is certain. Any company that joins metal in sufficient volume to be vitally concerned about unit costs owes it to the profit and loss statement to look into resistance welding. Its biggest dividend is time saving, which necessarily has to be spread over a large number of pieces.

Product designers are opening up other fields of application. By eliminating costly machined parts, intricate castings and expensive fastening operations, many companies are using resistance welding even though their volume is not high.

Some imaginative applications are worth noting. A typical one is at Kewanee Machinery & Conveyor Co., Kewanee, Ill. To make harrow teeth for farm equipment, this company clamps a diamond-shaped steel bar in the jaws of a machine, applies the resistance heat, then pulls the bar apart to form two sharp-pointed teeth. It used to take two skilled blacksmiths, a power hammer operator and his helper to do the same job.

The Cost—True, the initial investment for a standard resistance welding machine is much higher than, say, an arc welding rig. A 50-kva rockerarm machine, with its complete control panel will run from $800 to about $2100, depending on the quality of bearings, insulation, transformer, etc. A press-type welder of the same rating would range between $1600 and $3000.

It's easy to see why, with these starting prices, many plants look no further. Those that do often get jolted again when the power company tells them it will cost another x-dollars to hang some new line equipment to meet power demands. More often than not, this blow ends the investigation. But it shouldn't!

New Scale—The initial investment *is* high, but per-weld costs are ridiculously low. Power companies will charge you a demand rate, because power consumption is hardly worth metering. In the Detroit area, for instance, demand charges run 40 cents for the first kva and 10 cents for each additional kva.

Admittedly, volume production is the best way to pay for your welder in a hurry. But it needn't be in the same assembly. Fairly inexpensive tooling can change a welder's job in minutes. So volume can be made up of a number of assemblies.

One point is often overlooked: In practically every instance, unskilled labor can operate the machines. Timing, heatup and proper sequencing are pre-set in the controls. All the operator does is

The Spotlight's on Welding

Next week Kansas City, Mo., will host the annual Welding Show and National Spring Meeting of the American Welding Society. Technical sessions start Tuesday, June 7; the exposition opens Wednesday. Both will continue through Friday.

Resistance Welding Pays Off for These Companies

JOB	RESULTS
Gas tanks for outboard motors	Stolper Steel Products Corp., Menomonee Falls, Wis., turns out 50 tanks per hour on a 150-kva seam welder. Material is 20-gage terne plate. Except for a coat of red paint, no finishing is required.
Aluminum casement windows and screens	ABC Steel Equipment Co., Tampa, Fla., makes as many as 4000 flash butt welds in 8 hours. Tolerances are held within $\frac{1}{64}$-in. Finished joint has eye appeal.
Complete assembly of lightweight chain hoists	Chester Hoist division, National Screw & Mfg. Co., Kinsman, O., does six different operations on one standard 3-phase machine. By quickly changing tooling, both spot and projection welds are made.
Welding bail clips to galvanized cans	Cincinnati Galvanizing Co. hopper feeds the clips into position under the projection welding heads. Operator merely inserts can, presses foot pedal and job is done.
Automobile bumper guards	Grand Rapids Metalcraft, a division of F. L. Jacobs Co., fabricates more than 3000 bumper guards a day on three 3-phase machines. Unskilled operators do the work of 12 experienced arc welders.
Aluminum pitchers	Colorcraft Co., Indianapolis, is saving 50 per cent on the cost of joining handles to aluminum pitchers. One operator exceeds the output of three men attaching handles with screws.
3.5 in. bazooka rocket fins	Heckethorn Mfg. Co., Littleton, Colo., turns out 5000 assemblies in a work shift of 6 hours and 40 minutes. Four unskilled women make 60,000 spotwelds on four standard 3-phase machines. Parts meet rigid government specifications.
Welding hinges to cabinet doors	Mullins Mfg. Co., Salem, O., mounts two standard projection welders facing each other. Both hinges are welded in one setup with a single control. One head is movable to adjust to all sizes of cabinet doors.

If You're Considering Resistance Welding . . .

DO call on a reputable equipment manufacturer to help you analyze the job.

DO check with your local power company to see if your lines can carry the load.

DON'T be too hasty in ruling out an expenditure for additional line equipment. Your savings may foot the bill in a few months.

DON'T overlook the possibility of installing 3-phase equipment even though it's more costly. It may be a far cheaper solution to your power problem than building up line equipment.

DON'T let a $15,000 or $20,000 pricetag frighten you away from bigger machines. One man may be able to do the work of five or six, and much of the expenditure is in fast-write-off tooling.

position the parts and step on a foot pedal. With hopper feeding or indexing tooling, he often merely tends the machine.

Jobbers' Joy—There are increasing signs that job shop stampers and forgers are looking to resistance welding to help them through the tough, competitive times. A sampling of Cleveland-area jobbers brought forth these remarks:

"I'd be in better shape today if I had started resistance welding ten years ago. I could have bid on a lot more jobs."

"Been using a couple of machines for nearly 20 years. Don't mention our name. Some of our competitors haven't woke up yet."

"Like it or not, you can't remain just a job stamper and expect to survive. With GAW coming, it's going to get even rougher. We resistance weld now, and the next step is a finishing line."

Look Again—If you're one of those companies that investigated resistance welding a few years ago and turned thumbs down because of a power problem, take a fresh look. An economical 3-phase machine is doing a good job.

Power factor is 85 per cent, instead of 30 per cent for a comparable single-phase machine. There's a 50 per cent reduction in power demand and no need for expensive current compensators. Here's what it meant on one job:

	Single Phase	Three Phase
Transformer rating	250 kva	100 kva
Power demand	650 kva	325 kva
Line amps per conductor, 440 v	1476	430
Power factor	30%	85%
Installation cost	$10,500	$5250

What It Will Do—Everything from delicate electronic components to heavy fabrications with steel plate, tubes or bars can be

Small Operations Grow with Resistance Welding

Alert management at Modern Tool & Die Co., Cleveland, saw resistance welding as a way to smooth out the peaks and valleys in the job stamping business. Ten years ago, two machines were doing assembly work. Now, 34 are on the job.

All are standard floor or bench models. Production schedules are leveled out with minor electrode or fixture changes. Here are some job rates:

1. Automotive parts: Two machines do 10 welds per piece, 2500 in 9 hours.
2. Automotive parts: Four machines do 7 welds per piece, 22 to 20-gage steel, 3000 to 3500 per day.
3. Auto heater parts: Made of 22-gage steel, 45,000 units a day.
4. Special job: Made of 24-gage steel, 35,000 units a day.

joined with resistance machines. With proper control settings, gages as thin as 0.001 in. and sheet piles as thick as 6 in. have been welded. The belief that the process is strictly for the medium gages no longer holds. The list of weldable metals is practically all inclusive, too.

No matter what the job (or kind of metal), one of the five basic welders will handle it. Without going into the details, here's what each will do:

Spot Welder—Comparatively small contact surfaces of the electrodes press two pieces of metal (or several sheets in a laminate) together. Heat generated by resistance to the current applied between electrodes causes contacted metal to become plastic. Pressure unites the two pieces. This is the simplest and least expensive of the resistance welds. Where you can, design parts for lap edges so you can take advantage of the economies.

Projection Welding—The theory is the same as spot welding, except that preformed projections in one or both of the parts to be joined act as the electrode tips. Projections can be embossed, cast or machined in the parts. Current-carrying dies press the parts together, welding them where there are heat-localizing projections. Advantages over spot welding: This system is faster and much more versatile in the number of shapes that can be welded.

Flash Butt Welding — Ends or edges of metal can be joined by clamping two pieces in a die designed for each job. Initial contact is just enough to cause an arc flash between the two parts. After a timed interval, full pressure forges the ends together, upsetting some of the molten metal at the joint. Greater heat and pressure are required than in other resistance methods.

Roll Spot Welding—Wheels of a copper alloy serve as current carriers and pressure agents. One or both of the wheels may be powered to propel the work through the welder. At predetermined intervals, the control system fires a "shot" of current, creating an intermittent line of spot welds.

Seam Welding—Picture the machine used for roll spot welding, but with the controls set to fire in rapid succession, so that the "spots" overlap each other. That's what the seam welder does, producing a joint that is water and gas-tight.

Last Word—This discussion obviously skips lightly over the vital points you'll want to consider if you have become interested in resistance welding. They should be thoroughly explored with an equipment builder.

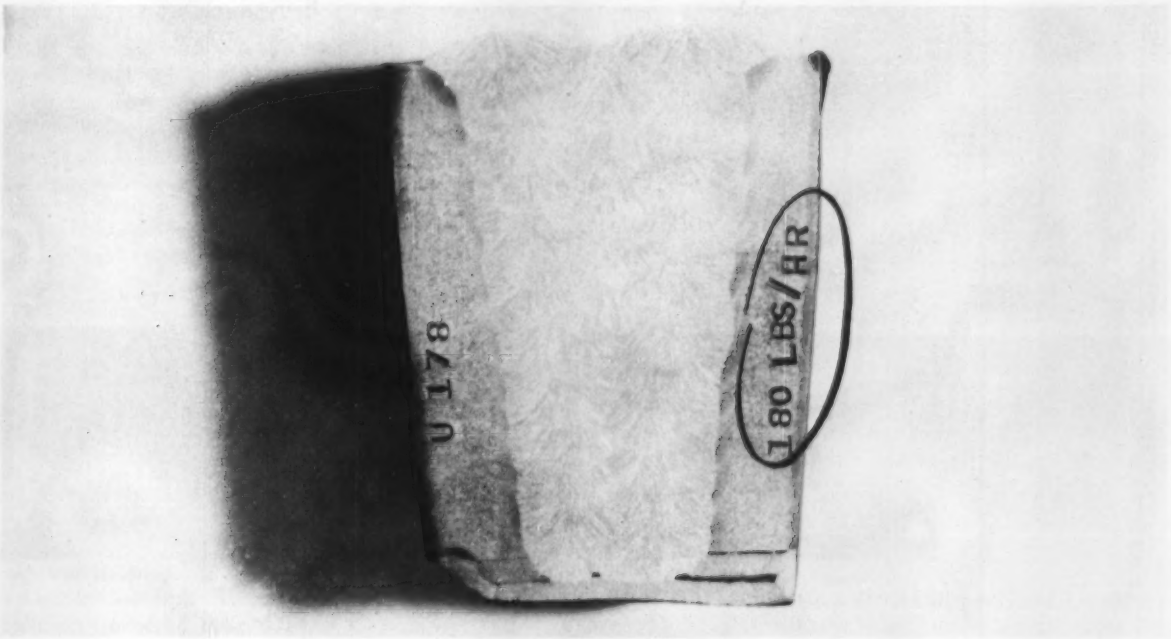
Can you afford *not* to take another look at resistance welding?

More Information

The Resistance Welding Manufacturers' Association, 1900 Arch St., Philadelphia 3, Pa., is equipped to supply you with general and technical data. A job problem will be circulated to all members on request.

STEEL thanks the following equipment manufacturers for much of the basic information in this story: Sciaky Bros. Inc., Chicago; Welding Machines Mfg. Co., Detroit; Progressive Welder Sales Co., Pontiac, Mich.; Taylor-Winfield Corp. and Federal Machine & Welder Co., Warren, O.; Swift Electric Welder Co., Detroit.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*



Deposition rates of 180 lb/hr are just "average" when . . .

New Welder Shatters Speed Records

WANT TO WELD some five times faster and consume only half the power it would ordinarily take? Engineers at Babcock & Wilcox Co.'s Research Center in Alliance, O., are in the final stages of developing just such a high speed process.

Applicable to the submerged arc principle of welding, B & W researchers have proved the system using 70,000 psi carbon-steel electrode on production welds of heavy sections. Experiments indicate that the welder will show proportionate advantages when using alloy electrodes.

Different Idea—Where standard submerged-arc welding practices have been based on the idea that deposit rate is directly proportional to electrode diameter, this system proves the opposite to be true. In one instance, a higher deposit rate was obtained with a 3/32-in. electrode at 650 amp than with a ¼-in. electrode at 800 amp.

It is now believed that deposit rate at high current density is directly proportional to the length of the electrode wire from the contact shoe to the arc. This discovery led to the I^2RT principle, as it is called. The new process preheats the electrode almost to its melting point before it enters the arc. Thus practically all the energy absorbed by the electrode at the arc supplies heat of fusion to melt the metal.

Advantages—Speed is the obvious advantage. Recent improvements in the process show that the I^2RT method can deposit five times as much metal per unit time than any known method. Researchers are confident they can deposit metal at 200 to 250 lb/hr using a current of 1800 to 2000 amp, after further refinements are incorporated.

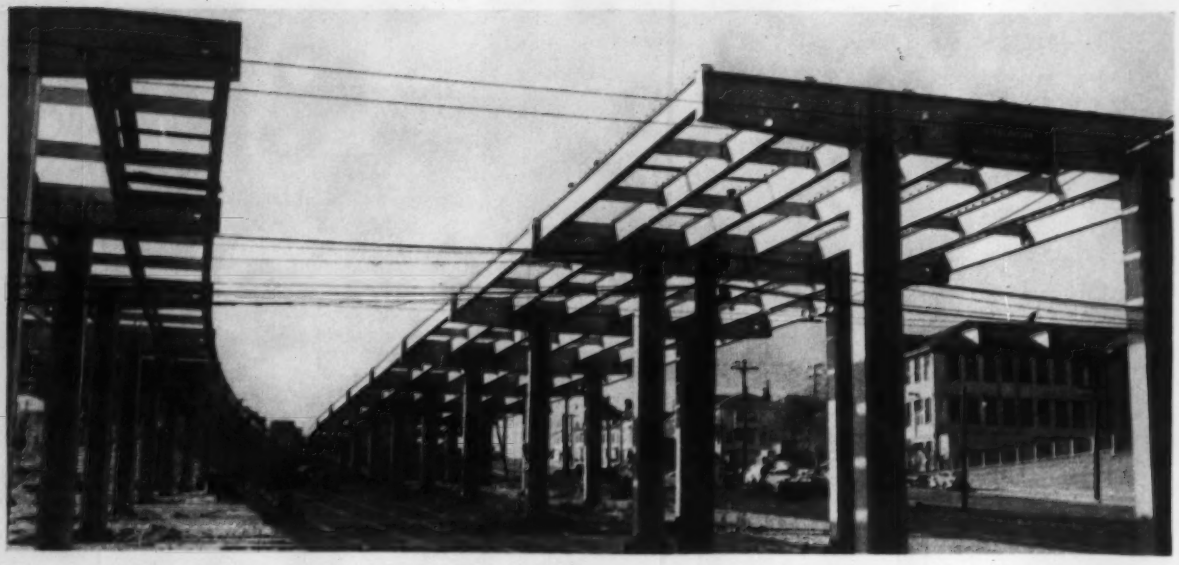
B & W estimates that actual welding costs will be cut in half. Test results show that the process uses 0.65 kwh/lb of electrode deposited. This compares with the approximate 1.2 kwh/lb rate for comparable welding methods. There are good indications that the process melts less of the base metal in ratio to filler metal, too.

Can Convert—The I^2RT method can be adapted to existing welding systems, research engineers believe. The cost should be considered small since the equipment will pay for itself so rapidly. The entire system is expected to cost no more than present automatic welding systems.

Conversion to this type of welding would consist mainly of installing suitable transformer capacity and increasing the rate of wire electrode feed. In some cases larger or additional transformers would be required since the process needs double the load voltage formerly required. Travel speeds would also have to be increased.

What Happens—In operation, a voltage sensitive relay controls the length of electrode projecting from the nozzle. Changes in the load voltage are received by this relay, which signals the raising or lowering of the weld head.

Granular flux depth is approximately 1 to 1½-in. To keep pace with the fast deposition of metal, B & W engineers have developed a special guiding device that keeps the weld head and arc trued up with the work. Beads are deposited too fast for accurate manual guiding.



Thanks to the hidden-arc process, this job set . . .

New Record for All-Welded Construction

By W. L. DOHERTY
Welding Engineer
Lincoln Electric Co.
Cleveland

ANY DOUBTS we may have had on how manual, hidden-arc welding techniques work on a really big structural job should be dispelled. The skyway connecting San Francisco's Bay Shore freeway and the Oakland Bay bridge soon will be completed. Involving almost 2½-million lineal feet of welding, 65 per cent of it was done with manual equipment.

Some 30,000 tons of structural steel (almost 20 per cent less than estimates for riveted construction) will go into the finished structure. Plate thicknesses go up to 2½-in.

Why Welding — Weight saving wasn't the only reason for the choice. City fathers wanted a design which would be aesthetically pleasing to protect property values in downtown San Francisco. (The American Institute of Steel Construction has hailed the structure as one the most beautiful in its class.)

The lighter weight of the welded design made it possible to save on foundations, too. The underfooting in the area was extremely poor. In places, piles up to 90 ft long had to be driven.

The Job — Although varying in size, only three basic weldments were used: Girders (longitudinal and transverse), columns and the steel grillage for the concrete column foundations.

The structure was designed so that almost all welding could be done in the shop by automatic and semiautomatic processes. Independent Iron Works and Judson Pacific-Murphy Corp., both of Oakland, Calif., took full advantage of

Shear connectors were welded to top flanges of the longitudinal beams,

design opportunities to minimize field welding.

The number and size of weldments ordinarily would have required more operating stations, fixtures and work handling facilities than any fabricator possesses. For that reason, work was laid out wherever it was most convenient, and the highly portable "squirt" welders got the job done quickly and easily.

Worksavers — The welding of stiffeners to the girder webs took a large number of operators and considerable space. By mounting the welding machine, "squirt" welder, flux dispenser and vacuum on a platform that would ride on the flanges of the girders, the job was speeded up. Platforms were crane lifted to another girder as each was finished.

Another example of contractor ingenuity involved the fabrication of the huge columns. They presented many positioning problems. A "squirt" gun welder was mounted on a lightweight, three-wheel, motorized carriage which weighed less than 25 lb and could operate within an 8-in. space. These so-called doodle-bugs did the work of automatic equipment on many of the hard-to-reach joints.

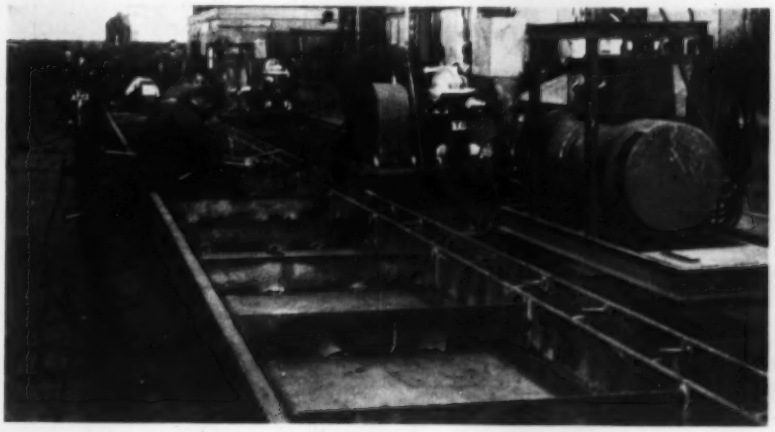
Design Features—The bridge is a composite design. The concrete slab of the deck is supported by longitudinal girders which have shear connectors welded to the upper flange of the beams. They make the slab act as an integral unit with the supporting beams and girders.

Transverse steel bents consist of cap girders supported by one, two or three columns. Ramps of more than four lanes are supported by two and three-column bents, and ramps of less than four lanes are supported by a single-column T-bent.

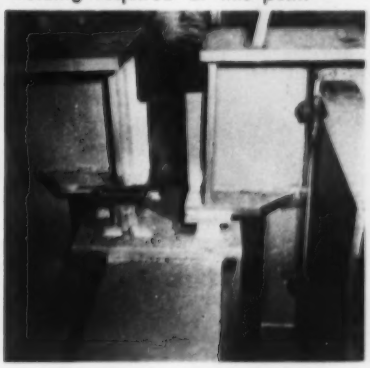
In the design, American Welding Society specifications for welded highway and railroad bridges are used. Material over 1 in. thick is welded with the hidden arc process or low-hydrogen electrode.

This photo reveals the beauty that is inherent in this type construction

then these members were moved inside for welding of the web stiffeners

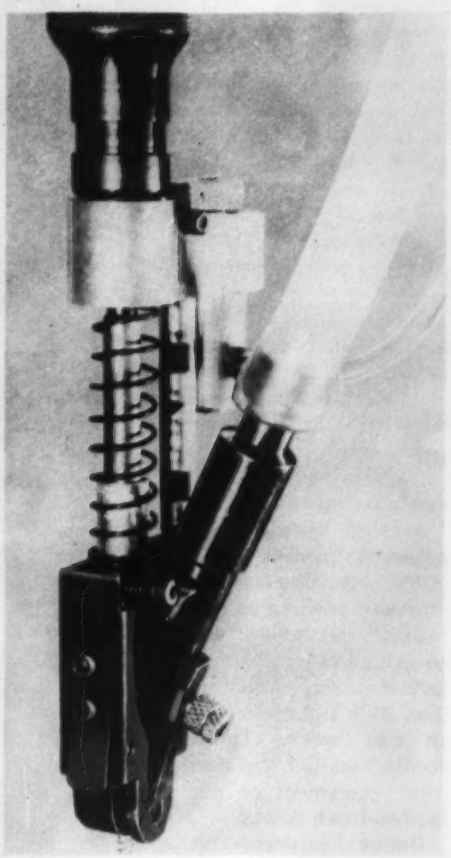


Here's how longitudinal beams are joined to the cap girders. Shop-painted welds indicate extent of field welding required at this point



Operator uses automatic screw-feeding device on heating-unit assembly

Close-up of delivery head with screw in driving position. Screws feed through large plastic tube, upper right



Screwdriver Makes Comeback

Attaching a new, screw-feeding device to your power screwdriver will halve your fastening time. It feeds automatically at any angle

ONE MAN is doing the job of three at SelecTemp Division of Iron Fireman Mfg. Co., Cleveland. On an operation that required locating and driving 17 screws in an irregularly shaped pattern, it took one man, sometimes two, to hand start the screws ahead of the man operating a power screwdriver. Today, the power screwdriver operator does the whole job by himself.

The secret? A new device called Pneuma-Serve. It feeds screws automatically and almost instantaneously from a hopper to a head that fits most standard power screwdrivers. Although designed to augment existing hand-operated equipment, it is equally adaptable to complete automation. In either case, all hand placing of screws is eliminated.

Tested and Proved—In automotive, electrical appliance and heater-air conditioner plants where automated Pneuma-Serve screw feeding has been tested, the speed of fastening operations has been stepped up from 50 to 400 per cent.

On simple jobs, even when using power screwdrivers, operators spend 50 to 60 per cent of their time hand starting screws before driving them. At SelecTemp Division, under the new arrangement, no more than 30 seconds are spent on the fastening operation, even when the time of handling assemblies is added.

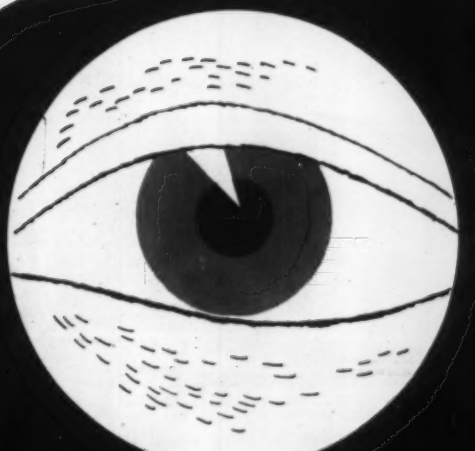
How It Works—From a reserve hopper, which holds enough screws for 5-to-8-hours work, another, smaller pick-up hopper positions screws in an elevator. They are fed to a magazine track and aligned with the screw feed tube. A cut-off plate allows compressed air to feed screws one at a time to the delivery head. After one screw is driven, the next is fed and instantly positioned. A valve attachment on the screwdriver controls air pressure. Tubing is plastic. The unit operates on 90-lb air pressure.

The head will handle a variety of types and sizes of screws, up to ¼-in. in diameter and 1¼-in. in length. It accommodates nearly all head styles, including screws with washers attached, self-tapping screws, sheet metal screws, machine screws and wood screws.

Advantages—Portability of the device allows an operator to take the driver and head assembly to work stations as far as 20 ft from the hopper. Screws can be driven at any angle, in any plane.

Other devices are available to deliver screws to the fastening point. With them, screws are driven straight down. The equipment usually is fixed, requiring parts to be brought directly underneath the driver.

The new, screw-feeding device is being merchandised by Pneuma-Serve, Inc., Cleveland.



17,763* manufacturing V.I.P.s on the lookout for better Production!

No need to squint through a keyhole, though. It's no secret that the latest, the fastest, the most ingenious in cost-cutting metalworking methods will be unveiled at the Machine Tool Show, in Chicago, in September.

More than ninety per cent of the country's leading machine tool builders will be on hand; it's the largest and most important show of its kind, the first since 1947.

Plan now to attend; you can't afford to miss it. And here's an added reason—you can see the latest in machine tool accessories at no additional cost. Your Machine Tool Show badge will admit you to the Production Engineering Show, on the Navy Pier, on the same dates.

Bring your key production people with you; share with them this unequaled opportunity to see the latest developments in machine tools. The 1955 Machine Tool Show is the best chance you've ever had to see **the world's best investment**—***in action!***

THE MACHINE TOOL SHOW

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NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION
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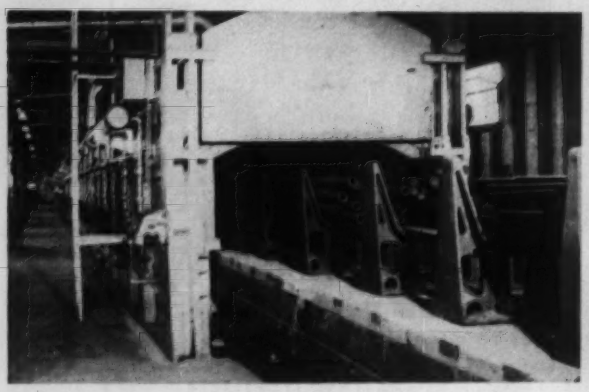
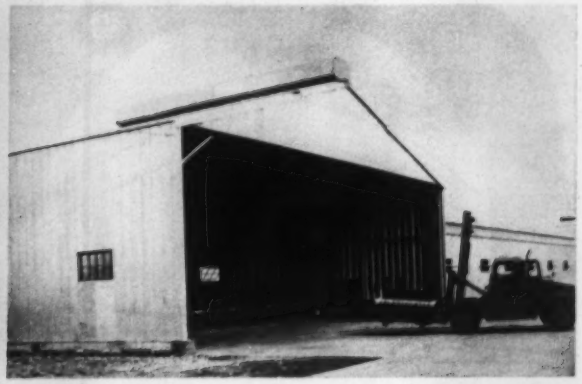


Entrance end of the furnace shows how refractory car top slides under sill of the furnace wall. Note the special brackets for lifting cars with a fork-lift truck



Truck returns an empty car to the starting point of the line. Inexpensive building could be used since there is no overhead crane required in this operation

Tunnel Furnace Is Low-Cost Annealer

By designing out overhead cranes and special, car-return mechanism, a lightweight metal building was sufficient. Car bottoms hold 1400 lb per linear foot of hearth

TUNNEL-TYPE furnaces are used almost exclusively in the ceramic industry. But Timken Roller Bearing Co., Canton, O., had an idea they could use them profitably for heat treating.

Over a year ago the company installed one for the annealing of tubes and bars. It worked so well that a second one was put into operation at its Gambrinus, O., plant late in 1954. By taking full advantage of inherent features of the furnace, Timken saved nearly $350,000 in initial cost.

Here's How—The hearth of this type furnace is made up of a series of cars with work-holding brackets welded on their tops. After cars are unloaded at one end, they must be returned to the starting point. Timken, using fork trucks for loading and unloading the steel, asked: Why not use the same truck to shuttle the cars? Here's where savings come in.

With no overhead cranes and no special, car-shunting requirements, the entire line could be housed in a simple quonset-type building (320 ft long). At each end of the furnace is a 60 x 60-ft metal shed with open sides that permit lift trucks to run in and out with either steel or car bottoms. A 16-ft concrete runway, equipped with heating pipes for ice-free operation in winter, permits trucks to operate in any kind of weather.

Details — Built by Olson Engineering Co., Pittsburgh, the furnace consists of a heating chamber which is 175 ft long x 6 2/3-ft wide. It is 4 ft high from the car deck to the spring line of the main arch. Baffle walls extend down from the roof separating the controlled zones. The side walls are 13½-in. thick and are encased in steel plate in the heating and soaking zones.

The hearth is made up of a string of cars, each a little over 8 ft long. Abutting ends of cars are sealed by overlapping refractories and by machine-finished surfaces on the substructure of the cars. The sides are sealed against air leakage with sand.

Refractory tops, 12½-in. thick, are of cast Hydrocon, with curb tile at the sides and ends. Car substructures of welded steel are supported on four, roller-bearing-equipped wheels. Car bottoms below the sand seals are ventilated by open ports—16 in. high from the floor level to the bottom of the refractory side walls.

Car Movement—Cars are moved through the furnace by a hydraulic cylinder having a stroke slightly longer than an individual car. This cylinder actuates a track dolly which carries a pivoted dog that engages the furnace car on the forward stroke only. Movement can be regulated for speeds from 5 to 15 ft per hour. Cars are designed for a load of 1400 lb per linear foot of hearth area.

There are seven zones in the furnace, individually thermocouple controlled. Tempered heat burners are arranged for burning either natural gas or propane; they fire both above and below the charge and from both sides of the annealing furnace.

Output—The charge is supported 13½-in. above the hearth on alloy steel cradles or piers. Bars or tubing are loaded no deeper than 18 in. on the piers, and in end-to-end fashion regardless of car length. This provides continuous loading of the entire length of the furnace with no dead space.

The furnace has a rated capacity ot 5 tons per hour when operating on cycle anneal, with controlled cooling of 20° F per hour and discharging at 1000° F. The furnace is designed for a maximum temperature of about 1750° F.

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J&L STEEL

quality forging steels

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At J&L strict metallurgical control of every operation from ore mine to finishing mill assures production of forging steels with the exact balance of properties you require.

In addition, J&L is prepared to help establish the particular specifications that give you the most desirable results. J&L's staff of experienced metallurgists is available to analyze your requirements.

Whether you are producing rugged, heavy-duty forgings or lightweight, high-strength parts, you'll find it profitable to use J&L steels.

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STEEL CORPORATION — *Pittsburgh*

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

MACHINE TOOL users are in line for more relief on their tax amortization of new machines. The Treasury department has added the problem of revising Bulletin F to its already long list of things to do.

This bulletin is the one which artificially defines a machine life for tax purposes. The big problem is that it was written around the physical life of the piece of equipment, rather than its useful life.

Variations—It assigns lives of from 15 to 30 years to the machines. Anyone who runs one knows that its useful life might be a fraction of its total physical life. The machine that's built to run well for 20 years may not produce to required tolerances for more than 10.

Also, the regulation has some inconsistencies. It specifies different lives for multi-spindle lathes and screw machines—and many machines fit both definitions. Also, a drop hammer might be given a longer life in a steel mill than in a machine shop, with no apparent reason.

Progress—This already has been remedied to some extent. The Treasury department recently has admitted that Bulletin F is out of date and is in need of revision.

More importantly, revenue agents have been told that the lives set up in Bulletin F are not to be interpreted literally for the enforcement of depreciation policies on taxpayers. A new printing of the bulletin carries a new foreword that adds the element of interpretation. With this new flexibility, a machine tool user may find it easier to put a practical machine life in his calculations.

Everett M. Hicks, vice president, Norton Co., and chairman of the machine tool builders' government relations committee, says: "Builders hold the view that the investor should be allowed to charge off the cost of new equipment over the expected profitable life of the asset, rather than using its entire physical life as the period of depreciation." This would permit users to allow for obsolescence.

Set to Go

None of that $84 million the Air Force is going to spend on reserve machine tools has changed hands. June, however, is the month. Officials at Wright Field told STEEL that contracts worth some $10 million will be signed before July 1.

Here's how it stands. Requests for proposals have been sent. They cover about half of the total program. Although only $10 million will be spent during the first half of this year, there's no doubt in the minds of Air Force representatives that the remainder will be spent in the last half.

They point out that the first five months were devoted to drawing up quantity and specification requirements, no small job when it consists of getting aircraft makers to agree on standard machines to handle their widely varying requirements. The program includes no special machines and no special tooling for any specific jobs.

Holders Jump Tool Life

Tool cost per piece is reduced from $0.054 to $0.0109 by new rigid tool holders

BAND-TYPE holders and solid carbide inserts have more than doubled production per tool grind in the machining of piston rod ends at a large midwestern tractor company.

With the insert-type tooling formerly used in turning and facing two surfaces of the part, only 20 pieces could be machined before the tool needed regrinding. With the new holders, the company machines 150 piston rod ends before regrinding the tool.

Economics—Initial cost of the former holders was $27, considerably less than a $77 outlay for new tooling. However, tool cost per piece has been reduced from $0.054 to $0.0109 with the new holders.

In the first machining operation, a ¼-in. radius is turned on the 2 7/32-in. diameter of the rod end. The second operation, which is done with the new holder, consists of interrupted facing and forming a chamfer on the same diameter.

INTERRUPTED FACING CUT
. . . causes severe tool wear

Equipment—Work is done on a Monarch engine lathe. The feed used was 0.012-in. It has been increased to 0.0153-in. Average depth of cut is 3/16-in. and surface speed is 310. On the interrupted facing cut, cutting speed goes from 310 sfpm down to zero.

The primary cause of high tool cost and limited tool life in this operation was excessive carbide breakage on the interrupted facing cut. The rigidity of the band-type holder, coupled with the hardness-strength properties of the solid Wessonmetal WS carbide inserts, eliminated this breakage.

Beauty with a PURPOSE!

Rigidized stainless from The House of Stainless provides beauty and utility for carefree service

Photos, courtesy Kiekhaefer Corporation, Fond du Lac, Wisconsin

THE NEED—In introducing their new 4-cylinders-in-line "Mark 55" outboard motors, Mercury engineers required a special wrap-around cowl that would (1) afford ready accessibility to the engine, (2) provide an attractive, distinctive appearance, and (3) at the same time, provide light-weight strength and durability in continuous service.

THE ANSWER—Rigidized stainless steel was selected because it meets these varied requirements. Its textured, raised design provides beauty that sets off the harmonizing two-tone colors used. Equally important, this stainless assures greater stiffness and buckling strength for the long service life demanded. Moreover, this extra strength enables them to use a lighter gauge, resulting in lower over-all engine weight.

The enthusiastic reception given this motor emphasizes once again the importance of selecting the *right* stainless for the job. Our metallurgists will be glad to work with you in adapting stainless to your product. And you can depend on The House of Stainless for the stainless you need—from our complete warehouse stocks or from mill shipments through our mill placement department.

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There was an air of optimism at the annual meeting of the Metal Powder Association in Philadelphia, May 10-12. Iron powder is being used at a rate almost double that of the last quarter of last year. Fabricators say up to 50 per cent more orders are coming in, compared with last year. (Since January one press builder has sold nine large presses.) This technical report on the meeting gives some of the reasons back of this activity . . .

Powdered Metal Products Div., Yale & Towne Mfg. Co.

Powder Pays in More Ways

YOU DON'T need large volume to make powder metallurgy work as a cost cutting tool in your plant.

B. I. Horton, methods engineer, Pitney - Bowes Inc., Stamford, Conn., has figures to prove that point. At the annual meeting of the Powder Metallurgy Association he showed a meter drive gear (8000 a year were made), and explained:

"This part was originally machined from a 1020 steel forging with a copper brazed-in hub. When it was converted to metal powder, the saving was about 80 per cent."

Tool cost for this job was $4000 and was amortized in less than one year of production. (The 14 D.P., 14½-degree P.A. gear has a pitch diameter of 2.7142.)

Meter Gib—This part formerly was machined from a 1020 steel forging. It was converted to powder metallurgy about three years ago. The average saving on 50,000 pieces a year has been about 85 per cent, reported Mr. Horton.

Tooling for this job cost about $1500 and was amortized in three months of production.

5000 Pieces a Year—This was the requirement for a knife cam part machined from 1020 bar stock. The saving was about 90 per cent with powder metallurgy. In less than a year, the tooling cost of $750 was amortized.

Plan to Use—"Savings increased as we began to get parts that had been designed for powder metallurgy methods," said Mr. Horton, stating:

"As we added equipment, we emphasized to our design sections the use of powder metallurgy as an initial production method and educated them in designing new parts for the process.

"In most cases the quantity of parts required was 10,000 a year or less; in many, only 1000. In practically every instance we found savings ranging from 40 to 80 per cent, and tool amortization time was less than two years."

Mr. Horton gave product design as a major factor in the success of low volume production of metal powder parts at Pitney-Bowes. "It is our conclusion that parts properly designed for the powder process cause less variables than those made as substitution for another production method," he said.

Consolidate — "Standardization of parts is another factor in our success," reported Mr. Horton. "When we standardized our self-lubricating bearings, we found parts that differed in dimension only by tolerance. By eliminating these and others that could be substituted with a bearing of almost the same size, we reduced the number of different bearings we required from 140 to 93."

Standardization of inside and outside diameters helped from a tooling standpoint. "We were able to produce 68 plain self-lubricating bearings from only 12 sets of tools, with additional punches and core rods," said Mr. Horton.

Prealloyed Steel Powders—Two types have important uses in the powder metallurgy field, George A.

Roberts, vice president—technology, Vanadium-Alloys Steel Co., Latrobe, Pa., told the metal powder meeting.

One is high strength, low alloy steel powder where hardenability of parts is an important factor. The other is stainless steel powder where corrosion resistance is required.

In prealloyed powders, each particle has the same composition, microstructure and hardenability as alloy steels in the massive state. Mr. Roberts said that it is impossible to get properties of these two types of prealloyed powders by mixing elemental powders.

Why?—The diffusion rate of the common alloying elements in steel is so slow that complete alloying is not attained in the time used for sintering.

Carbon can be alloyed with iron in a short time. This gives a steel part. But if sections of any size (over ¼ to ½-in. thick) have to be hardened, alloying elements are needed, too.

Record—Mr. Roberts said that SAE 4630A powder is making a fine record in gears for high pressure hydraulic pumps. (STEEL, Feb. 14, p. 84.) Performance equals or excels cut gears.

He reported: A metal powder gear in this application has never failed even when overloaded to the point where the shaft failed.

Other Points—The finish of the metal powder gear tooth is equal to a precision ground finish on a cut gear.

Also, the powdered steel gears have 80 per cent of the radial crushing strength of cut gears, which is adequate for the application.

Stainless Powders — Standard here are types 302B, 316, 318Si and 431. Filter sheet is made from stainless powder in a variety of pore openings. It can be fabricated by cold forming and welding. Bushings and structural parts also are made from stainless powders.

What About Titanium Powders?—For the answer to this question, here's an example given by H. W. Dodds, vice president, Brush Laboratories, Cleveland.

It's the case of a jet engine bearing housing weighing 1 lb. By the arc melting and forging process, 8 to 10 lb of sponge is needed as starting material to make the finished machined housing.

"By the Brush Laboratories powder metallurgy process we use 1.9 lb of sponge to make the 1-lb finished machined housing," said Mr. Dodds. There also is a saving in machining time.

Two Routes — Brush Laboratories has developed two methods for fabricating titanium powder parts: One takes care of the user who only wants a half dozen shaped pieces but doesn't want the expense of tooling forging dies or hogging the parts out of a billet. The other is for volume production.

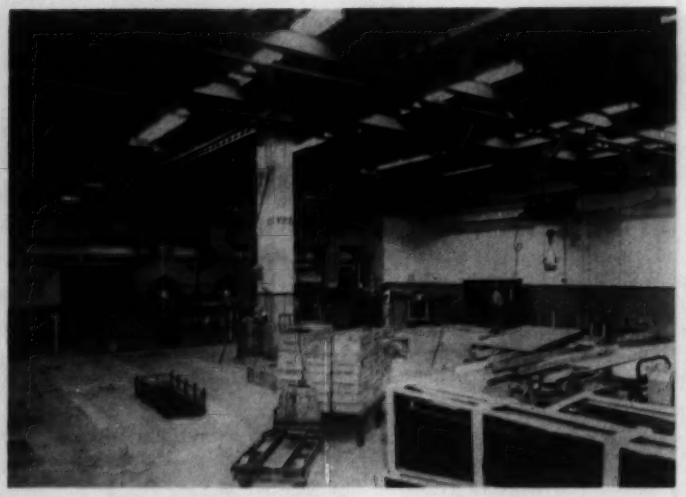
Here's how the first process works: A piece of graphite is machined to the contour of the part. It is filled with a weighed amount of powder and a graphite plunger is placed above the powder column. This assembly goes into a vacuum sintering furnace (1 to 2 microns) where it's heated to 1550-1650°F under hydraulic pressure.

Volume Production—In this case a press forming process is used. The powder is charged into a tool steel die and cold pressed into a briquet. It is sintered in a vacuum furnace at about 1850°F. Next, the cool compact is press formed under hydraulic pressure. After annealing, the compact is again press formed.

Future—J. F. Sachse, vice president, Metals Disintegrating Co. Inc., Elizabeth, N. J., told the metal powder group that the high cost of titanium metal is a strong incentive to adapt powder metallurgy to fabrication of titanium structural parts.

Mr. Sachse predicted that roll bonding of ductile titanium powder may emerge as a competitor to conventional methods for making titanium sheet.

Titanium powder metal part (right) made by Brush Laboratories, Cleveland, compared with strong blank (left) for forging the same part



In the heat-treating and pickling department, a 2-ton crane and monorail system (with one switch and a fixed transfer section) moves parts through processing and serves storage needs

Handling Gets Off the Ground

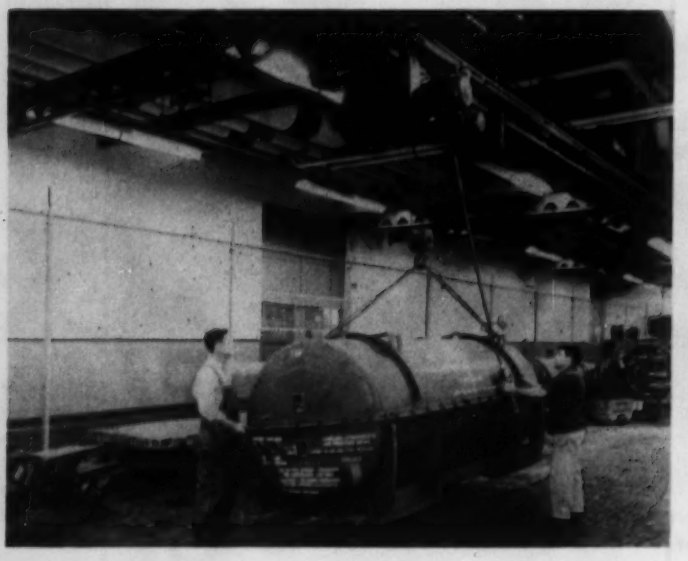
OVERHEAD materials handling equipment serves more than a million square feet at the Aviation Gas Turbine Division of Westinghouse Electric Corp., Kansas City, Mo.

Formerly the Naval Industrial Reserve Aircraft plant, it was reactivated by Westinghouse in 1949 to build jet engines. The plant covers about 53 acres (2,700,000 sq ft).

Planned Efficiency—Many parts of the plant could only be served best by overhead handling equipment. Allowing full utilization of production areas, it eliminates the need for wide aisles and permits improved plant housekeeping.

In many cases, an overhead track permits one hoist to serve a number of machines. This and other overhead installations are shown in the accompanying photographs.

Following final assembly, jet engines are packed in metal containers for shipment to the user and delivered by crane to shipping department



In the blade diaphragm shop, a Whiting T-beam monorail system, with manually operated switch, serves a row of tumbling mills which put blades through finishing processes

In the fabricating shop, this installation serves a battery of vertical turret lathes. In other parts of the shop one hoist may serve up to ten machines.

Gear Shaping Giant

It is 17 ft high and weighs 44 tons. Operation is a one-man job

GEARS 20 in. in diameter with 6-in. face widths are cut in 13 minutes on a new giant gear shaper. It used to take 3 hours to do the job.

Tooling setups, maintenance and operation are a one-man job. A hydraulic hoist swings the cutting head into position for mounting. The hoist also is used to load and unload part blanks that weigh up to several hundred pounds.

Features—A conveyor, built into the machine, carries away the large volume of chips removed from a part in one production cycle. On a gear cluster with 12½ and 6½-in. diameters and face widths of 3¾ and 5½-in., shaping will produce 15 lb of chips in 6½ minutes.

FIRST GEARS
. . . cut on this new gear shaper

Three automatic pressure lubricating systems feed oil to all moving parts. Hydraulic or pneumatic clamping fixtures can be used on the new models. Operation of the clamping fixture is tied into the automatic machining cycle. Cutting heads are interchangeable to accommodate different part sizes and shapes.

Complete tool changeover (cutting head, locating and clamping fixtures) can be done in 25 to 45 minutes. Called Shear-Speed Shapers, models 18136 and 18206, they are built by Michigan Tool Co., Detroit.

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COSMOLUBE E. P. grease

This new type multi-purpose lubricant—Cosmolube E.P. (extreme pressure treated) Grease—combines extra high film strength with unusual resistance to heat, cold and water.

Good example is the rolling mill operation shown. Cosmolube E.P. is withstanding not only terrific pressure in the roll neck bearings but constant dousing as well. This versatile grease *simplifies* lubrication and reduces chance of misapplication because of its wide range of uses.

Try Cosmolube E.P. Grease for any heavy-duty bearing application. You'll find it's especially satisfactory even under hot, cold, or wet conditions.

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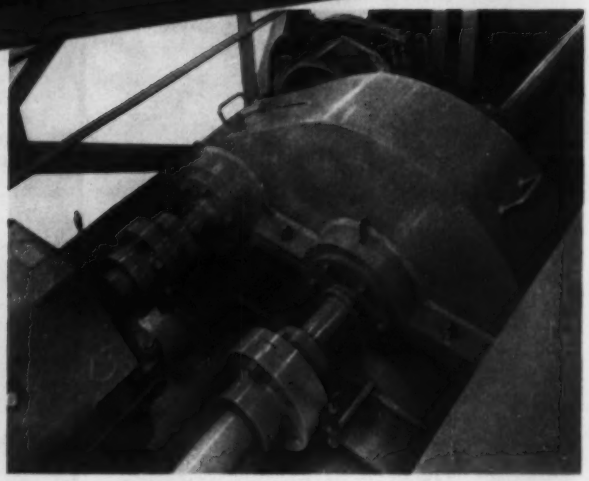
PROTECTS BETTER



heavy-duty
HOUGHTO-GEAR E. P. oils

Developed expressly to meet the lubrication demands of heavy-duty gearing, HOUGHTO-GEAR E.P. (extreme pressure treated) Oils stand up under loads impossible for standard oils.

Gear box shown is typical of the jobs Houghto-Gear E.P. does best. It is *long* lasting—and its durable oily film not only protects gear teeth from wear, but reduces maintenance costs and helps to eliminate production stops for replacement and adjustment.

Available in S.A.E. 90, S.A.E. 140 and S.A.E. 250, this heavy-duty, tough bodied gear oil may be the economical solution to your lubrication problem.

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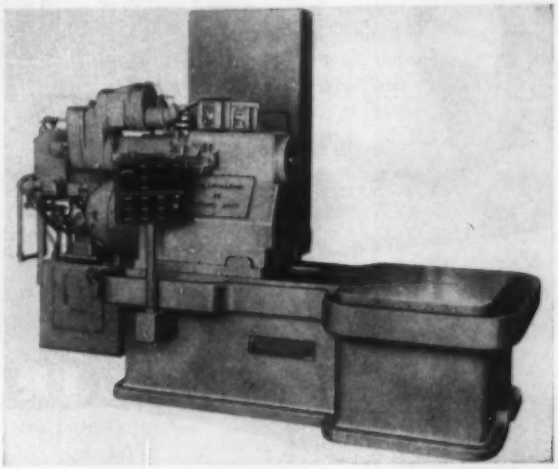
Boring Unit Features Short Run Versatility

The Millholland 3B machine is a fixed center, automatic unit which requires fixtures to locate workpiece height and position. It performs much of the work of a conventional, horizontal boring mill but costs much less.

The feed cycle is automatic, initiated by pushbutton. For manual operation, separate pushbuttons on the panel control rapid advance, coarse feed, fine feed, dwell and rapid return. In the preset automatic cycle, speeds, feeds and stroke can be varied to fit the requirements of the workpart.

The feed mechanism is operated by a hydraulic pump and fluid motor which permits variable feed rates. Cycle adjustments are furnished by a system of valves and piping. Longitudinal adjustment of the boring unit by handcrank is available. *Write:* W. K. Millholland Machinery Co. Inc., 6402 Westfield Blvd., Indianapolis 20, Ind. *Phone:* Glendale 2216



High-Speed Shear Slices Heavy Aluminum Plate

A shearing line, which includes two side-cut shears and one end-cut shear, cuts aluminum plates 1¼-in. thick, 12 ft wide and 40 ft long. Plates are moved through the machines by roller conveyor tables, which are electrically driven.

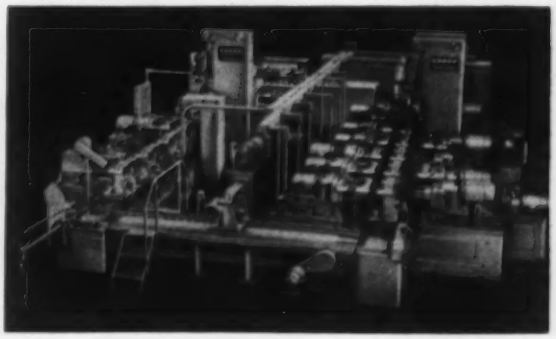
The side shears cut about 12 ft at each stroke; then plates advance until the full length is trimmed. The end-cut shear squares ends of plates or cuts a long plate into smaller lengths.

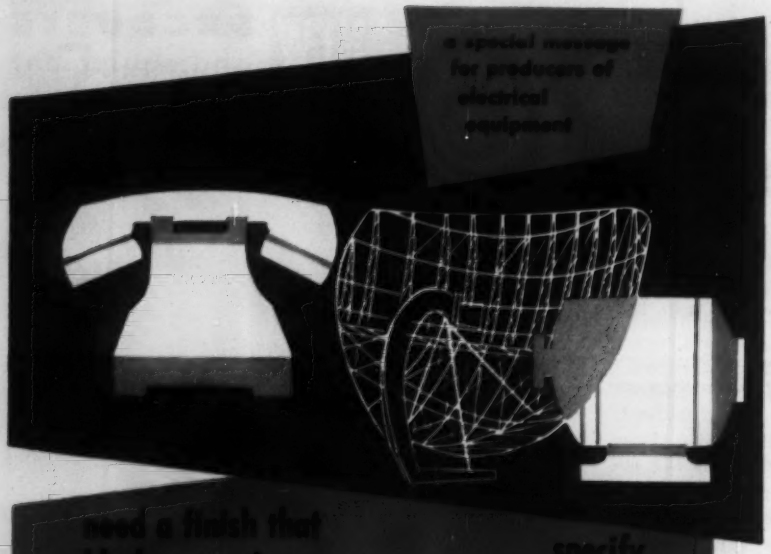
Small blades set at a 45 degree angle to the regular blades of the side shears take off scrap before the plate is advanced. The great range of widths possible on the shearing line make it extremely flexible. *Write:* Stamco Inc., New Bremen, O. *Phone:* New Bremen 7

Special Tool Machines Flywheel Housings

This unit performs 139 operations on 170 parts an hour at 100 per cent efficiency. Operations include drilling, chamfering, reaming, counterboring, inspection and tapping. Except for grinding three faces, the machine completely machines flywheel housings for both standard and automatic transmissions (STEEL, May 9, pp. 98-99).

Because parts are irregular in shape, special palletized work holding fixtures are used. Parts are clamped to fixtures by hydraulic power wrenches. Pallets transfer automatically from station to station and return to the loading station. *Write:* Cross Co., Detroit 7, Mich. *Phone:* Walnut 1-3000





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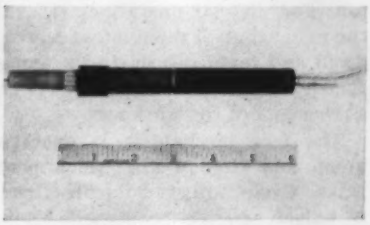
Welding Torch

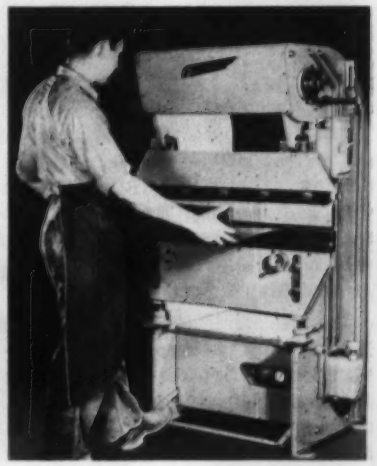
Designed for work in places hard to reach with torches of standard head angle, the Heliarc Pencil HW-9 will join mild steel and hard-to-weld metals. Because inert gas shields the immediate weld area, high quality welds are obtained. They require little or no finishing.



The torch has a 180-degree head, is light and small for easy manipulation. Without cable, the 7-in. torch weighs only 3 oz and has a maximum diameter of ¾-in. It is equipped with a 12½-ft power cable and has a 110-amp continuous-duty current capacity. *Write:* Linde Air Products Co., a division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone:* Murray Hill 7-8000

Hydraulic Press Brake

The Di-Acro Hydra-Power press brake features stroke control. The most practical length of stroke for each job can be preset, and the ram can be stopped or reversed at any point. The unit develops 12



tons of pressure and has a bed and ram 36 in. long.

A production rate of 60 strokes a minute is possible on a ¼-in. stroke; at the full 1½-in. opening, 24 strokes a minute can be maintained. Although a greater number of strokes a minute can be attained with a short stroke, the ram speed remains constant. Any length of stroke can be obtained by a quick adjustment of a selector. *Write:* O'Neil-Irwin Mfg. Co., 619 Eighth Ave., Lake City, Minn. *Phone:* Lake City 6311

Hardness Tester

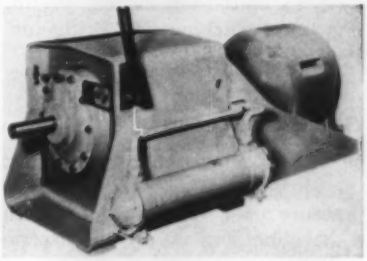
A variety of chain, magnetic and C-type clamps permit the Mark VI Penetrascope to test the hardness of metal specimens ranging from 0.002-in. thick strips to cylinders over 8 ft in diameter. Accuracy is obtained in the 16 to 800/1000 D.P.H. range (from softer than 0 on the Rockwell B scale to 64/69 Rockwell C), with good comparative results to 1500 D.P.H. (75 Rockwell C).

The instrument is portable and can be fastened directly to parts in the laboratory or on the assembly line. It tests ferrous as well as nonferrous metals. *Write:* Tinius Olsen Testing Machine Co., 141 Easton Rd., Willow Grove, Pa. *Phone:* Osborn 5-7100

Fluid Drives

Here is a new line of enclosed, self-contained units featuring stepless speed control, no-load starting and torque limiting control. They are designed for dual rotation and are adaptable for manual or fully automatic control.

Designated the Type-VS Class-2 Gyrol fluid drives, the units are available in six sizes from 7½ to 800 hp. Operating speeds go up to 1800 rpm. They limit the amount of overload torque which can be transmitted to the load. Torque transmitting capacity is adjusted by positioning the speed control lever. Rate of movement of the lever governs acceleration rate.

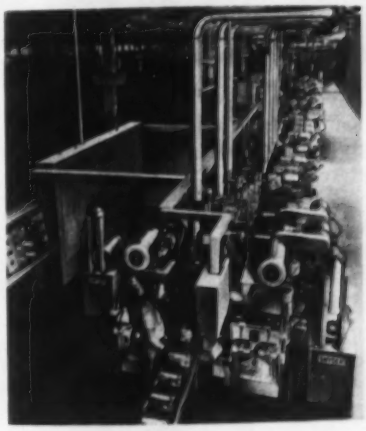


This adjustable speed characteristic permits operation at the minimum possible speed consistent with load requirements. *Write:* American Blower Corp., Detroit 32, Mich. *Phone:* Townsend 8-8945

Automation Line

A new, inline transfer machine performs 182 milling, drilling, tapping and boring operations on a cast iron, automatic transmission housing for autos. Made in four sections, the machine is 150 ft long. It produces 100 housings an hour at 80 per cent efficiency.

Each section of the machine, which has a single transfer line, can be individually controlled, loaded and unloaded, to utilize the advantages of sectionalized automation. Operation of all sections can be controlled by one operator. *Write:* Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich. *Phone:* Lorain 7-0123



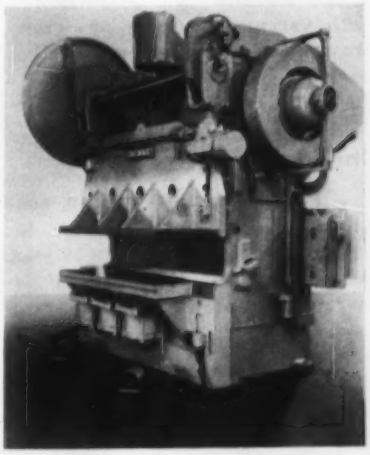
Pipe Jacketing

Aluminum foil laminated onto vaporproofed asbestos cloth is resistant to fire, acid and water. It can be used to cover pipe insulation in heating, piping, refrigeration and air conditioning systems.

Called Asbeston pipe insulation jacketing, it requires no painting. A square yard weighs 12 oz. *Write:* U. S. Rubber Co., Rockefeller Center, New York 20, N. Y. *Phone:* Circle 7-5000

All-Steel Press Brake

This 17-ton machine is used for shallow-draw work and various types of press operations. Its bed is 36 in. wide. The ram has a shut height of 15 in. and an overall die surface of 8 ft. Six, 12-in. air cushions are mounted on the underside of the bed, front and back.

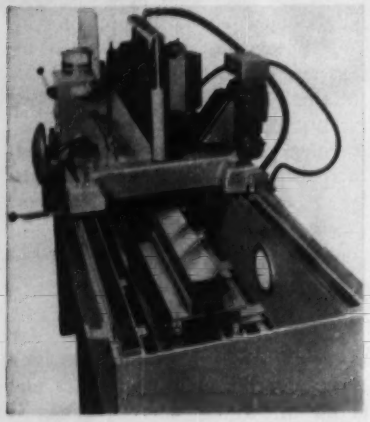


An air-electric clutch provides automatic stop and nonrepeat. Two foot pedals operate as one unit or separately.

Additional features include a two-speed transmission which operates 13 and 30 strokes per minute, an air counterbalance and a 5-in. stroke. *Write:* Cincinnati Shaper Co., Hopple, Garrard & Elam Sts., Cincinnati 25, O. *Phone:* Kirby 5010

Surface Grinder

This low-priced, automatic wet grinder is designed for maximum work visibility. Operators can inspect for finish and accuracy without removing work from the machine or disturbing the grinding cycle.

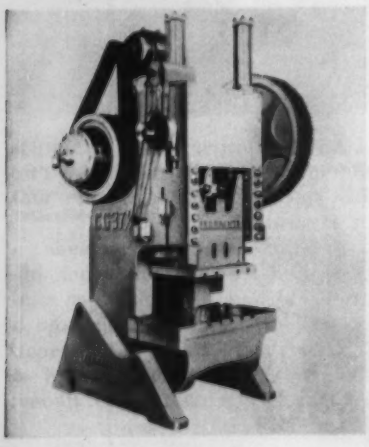


Work can be secured with holding fixtures or a magnetic chuck. All backlash is eliminated in the feed mechanism by a pneumatic counterbalance.

The machine can be furnished with various motors, wheel sizes, traverse speeds and bed lengths. *Write:* Lempco Industrial Inc., Bedford, O. *Phone:* Montrose 2-2400

Inclinable Press

An air powered, electric controlled friction clutch with an interconnected brake and single point adjustment provides rapid and accurate start-stop control for this 200-ton, open back press. The box-type ram is counterbalanced.

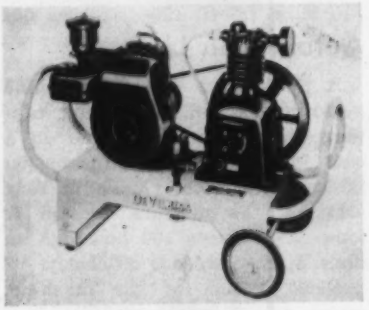


Designed for cutting, punching, stamping, shallow drawing and forming, the press will accommodate any type automatic or semi-automatic feed attachments. A bed-mounted die cushion can be installed for drawing medium gage metals. This press also is available in 110 and 150-ton models. *Write:* Ferracute Machine Co., Bridgeton, N. J. *Phone:* Bridgeton 9-2200

Air Compressor

Here is a portable, ½-hp unit for spray painting and other low pressure uses. It is available with a gasoline engine or an electric motor.

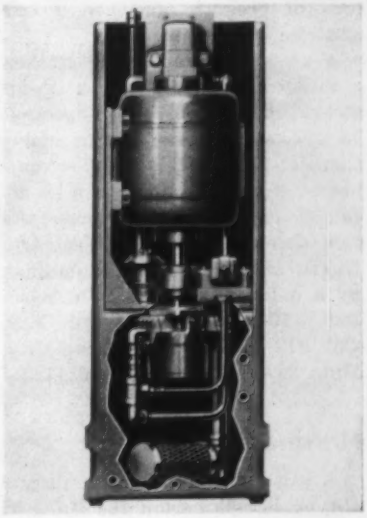
The compressor is of upright, single cylinder design, with the cylinder block and crankcase cast as one unit. A regulating safety valve prevents overloading and provides a means of adjusting air pressure. Air is filtered upon entering the unit and is clean when delivered. *Write:* DeVilbiss Co., 300 Phillips Ave., Toledo 1, O. *Phone:* Kingwood 5411



C-Press Power Unit

Here is a unit for small press operations. Pump and motor are vertically mounted on a common plate, which also serves as the cover for the hydraulic oil reservoir. The pressure control valve is panel mounted on the cover. The entire assembly may be installed or removed as a unit.

Panel-mounted valves eliminate maintenance problems of conventional equipment. The number of pipe and tube connections is reduced to a minimum. Better, more efficient operation is reported by the manufacturer for a wide range of applications in the 2 to 200-ton class. *Write*: Hydraulic Press Mfg. Co., Mt. Gilead, O. *Phone*: Mt. Gilead 35



Metal Separator Drum

Ferrous and nonferrous metals are separated economically by this new unit. A revolving cylindrical shell, it has a stationary bank of permanent magnets inside.

Material to be cleaned is fed onto the shell. The nonmagnetic falls freely and separately from the unit. Ferrous content is held against the shell. When it passes out of the magnetic field, it drops into a container. *Write:* Eriez Mfg. Co., Erie, Pa. *Phone:* 4-0133

NEW literature

Write directly to the company for a copy

Welding Specs

Chemical and screen analyses for powder metals and alloys, processed minerals and ores and chemical analyses of metals and alloys are given in this comprehensive welding materials specification book, *Shieldalloy Materials for the Welding Industry.* It describes chromium metal, titanium-aluminum master alloy, powdered ferroalloys and melting-base alloy, processed fluorspar, rutile and zircon —37 pages. Shieldalloy Corp., 99 Park Ave., New York 16, N. Y.

Aluminum

This book describes process applications by industry and by product. It features a comprehensive directory on the performance of aluminum with various chemicals and details the latest information on designing processing equipment—80 pages. Aluminum Co. of America, 761 Alcoa Bldg., Pittsburgh 19, Pa.

Production Heat Treating

Described is automatic equipment for heat treating and cadmium or zinc plating—2 pages. Commonwealth Industries Inc., 5922 Commonwealth Ave., Detroit 8, Mich.

Overhead Handling

Machine operators at Verson Allsteel Press Co., Chicago, use Trambeam cranes with pendant, pushbutton controls to position parts for machining. Parts weigh up to 10 tons. Here is "how-to" information —bulletin M-28, 4 pages. Whiting Corp., Harvey, Ill.

Investment Castings

"Crucible Accumet Precision Investment Castings" describes the techniques developed by the company's engineers and metallurgists in the use of the "lost wax" method —16 pages. Advertising Dept., Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.

Cleaning Forgings

Here is a case history: A large oil tool and equipment company is using an airless, abrasive blast cleaning machine to clean forgings weighing nearly a ton each. Time: 15 to 20 minutes—bulletin 744-4, 4 pages. American Wheelabrator & Equipment Corp., 1157 S. Byrkit St., Mishawaka, Ind.

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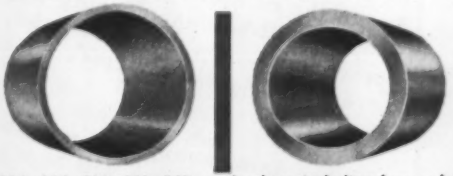
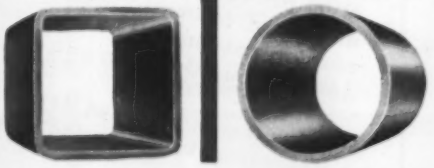


PIPE SIZES: ⅛" to 2" IPS Schedule 40

TYPES: 430, 302, 304, 309, 316, 321, 347; and others including low-carbon grades.

SHAPES: Squares, Rectangles and Special Shapes



PIPE SIZES: ⅛" to 4" IPS Schedules 5 & 10

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1701 Rockingham Road
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Telephone 6-2561

Open letter to Nickel consumers

Gentlemen:

The scarcity of nickel and its alloys and the prices of these commodities has been a subject of much concern and comment both here and abroad. Nickel and its alloys are essential ingredients in the manufacture of both military and civilian goods and, as such, maintains a position of utmost importance in the metallurgical field. The scarcity of nickel is something about which we are very much concerned and we are attempting to the best of our ability to alleviate part of the shortage.

We have the facilities and the technical knowledge to make top quality master alloys from scrap and residues. Our secondary nickel alloy products are made exclusively from scrap and no virgin nickel is consumed in our plant other than for experimental use or defense orders.

At times, the cost of production of secondary alloys is extremely high due to the complexity of our processes and, naturally, the price of our product will be considerably higher than that of its various virgin metal components. On the other hand, certain alloys which we produce from scrap can be sold at prices considerably lower than those of prime producers.

We are doing everything possible to supply domestic industry with nickel alloy products which will best suit their needs. Where supplies are in excess of domestic demand, we are willing and able to supply friendly foreign nations with nickel alloys wherever it is consistent with the policies of our Government.

We welcome your inquiries and will do everything possible to fill your requirements where the supply of raw materials permits.

Very truly yours,

ALTER COMPANY

Arant H. Sherman

By: Arant H. Sherman,
Vice President

AHS:ph

STRETCHING AMERICA'S SUPPLY OF VITAL METALS

Market Outlook

STEEL PRODUCTION set another weekly tonnage record: 2,340,880 net tons of ingots and castings.

That record came in the week ended May 29, with ingot operations at 97 per cent of capacity.

Previous record was the 2,328,800 tons made in each of the preceding three weeks.

HEADED FOR A RECORD—These high rates are making it look like May will be the all-time record month for ingot output. STEEL estimates that May production will be 10.3 million net tons. In chalking up the record (10,168,098 tons in March, 1953), the industry ran at 101.8 per cent of capacity. Continued increase in capacity makes it possible to set a new mark while operating at around 96.5 per cent of capacity.

A SALES STIMULUS—The high rate of production and shipment of steel is stimulating buyers to continue ordering. Some orders are not based on needs, for all needs are not known yet. Buyers, influenced by what's going on today, are simply trying to make sure they will have a place on order books if steel demand continues strong.

THE OUTLOOK— Just what are the chances for the steel production rate to hold to its record-breaking level?

One of the big influences, though not the only one, is the automobile industry. It has been taking 25 per cent of the finished steel output this year. The auto industry's projections for third-quarter output are 20 per cent under second-quarter projections. Model changeovers in the auto industry will start in June. In July and August, the plants of seven makes will be down for changeovers. Three others, and maybe more, will change over in September, the rest October or later.

MEASURING THE IMPACT—If automotive demand for steel declines in line with projected assemblies, the 20-per-cent reduction would lower the third-quarter national ingot rate 6 points under the second quarter's. If June is a 10-million-ton month, the second-quarter rate will be 96 per cent.

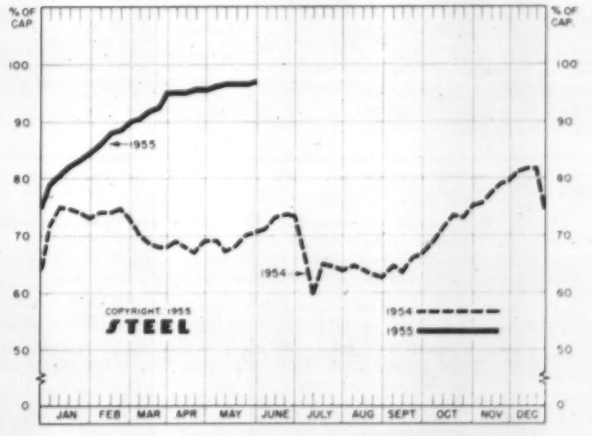
Railroads offer no prospect of taking up any slack that might develop. Backlogs of orders for railroad freight cars remain small. On May 1, 17,930 cars were on order, compared with 17,974 on Apr. 1.

In some products, such as wire for fence and bars for farm equipment, the seasonal rush is largely completed.

BUILDING INVENTORIES—Meanwhile, consumers are building steel inventories. Eventually, they will lessen some of the pressures of demand. Consumers began building inventories in March, when they laid away 732,000 tons. In April, they added 539,000 tons. The layaway in those two months equaled 8 per cent of the tonnage shipped by mills. Inventory building no doubt continued in May, for steel output was at a record level while production in the auto industry (the largest consumer) declined.

SCRAP DROPS AGAIN—The steel scrap market's performance continues to suggest a lowered rate of steel production is in the offing. STEEL's price composite on steelmaking grades of scrap eased to $34.67 a gross ton, the lowest since mid-January.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 29	Change	Same Week 1954	Same Week 1953
Pittsburgh	99	0*	69	95.5
Chicago	99	+ 1	84	105
Mid-Atlantic	96.5	+ 0.5	58	97.5
Youngstown	95	— 3	68	105
Wheeling	93	— 2.5	83.5	102
Cleveland	101	+ 2.5	70.5	105.5
Buffalo	104.5	0	67.5	106.5
Birmingham	96	+ 2.5	76.5	103
New England	85	— 3	50	85
Cincinnati	89.5	— 1.5	68.5	100
St. Louis	106	0	64.5	89.5
Detroit	94	+ 4	69	109.5
Western	104	+ 1	75	111
National Rate	97	+ 0.5	70.5	100.5

INGOT PRODUCTION‡

	Week Ended May 29	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	144.7†	145.5	143.6	105.7
NET TONS (In thousands)	2,324†	2,338	2,307	1,698

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 24 1955	May 17 1955	Month Ago	May Average
(1947-1949=100)	144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 24

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.075
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Buttweld (100 ft)	18.605
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.216
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	8.075
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.127
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.925
Sheets, C.R., Stainless, 302 (lb)	0.553		

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	May 25 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.75	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.70	$93.23
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	34.67	34.83	36.00	28.17	35.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	May 25 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50

SEMIFINSHED STEEL

Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, ½-⅝" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$35.50	$30.50	$39.00
No. 1 Heavy Melt, E. Pa.	35.50	36.00	37.50	23.00	32.50
No. 1 Heavy Melt, Chicago	34.00	34.00	35.00	31.00	35.00
No. 1 Heavy Melt, Valley	34.50	34.50	35.50	29.50	38.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	33.50	28.50	35.25
No. 1 Heavy Melt, Buffalo	29.50	30.50	32.50	25.50	34.50
Rails, Rerolling, Chicago	51.50	51.50	52.50	42.00	49.50
No. 1 Cast, Chicago	40.50	40.50	40.50	38.50	46.50

COKE, Net Ton

Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price May 25	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	33.222	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.800
Zinc	12.00	Apr. 6, 1955	11.50	11.927	11.500	10.290
Tin	91.75	May 25, 1955	91.50	91.468	87.194	93.600
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	27.556	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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Nonferrous Metals

Washington sees the aluminum shortage as a reason for taking a look at another expansion program. Release of extra metal hasn't offered much relief to small users

Nonferrous Metal Prices, Pages 98 & 99

THERE ARE INDICATIONS that Washington circles consider the aluminum shortage as something other than temporary.

Two things point this up: First, there is increasing talk and some action concerning expansion in basic production. Second, the release in early April of 75,000 tons of the light metal, which many said would relieve the shortage, has had little effect on the over-all situation, especially among independent fabricators.

Confession—At last, Defense Mobilizer Arthur Flemming has admitted that the government is studying the expansion problem. This column reported two months ago (STEEL, Mar. 28, p. 124) that Washington was taking a new interest in the matter. Mr. Flemming says his staff is making a comprehensive study of the problem and will report its findings about the middle of June. Then he will go to the Defense Mobilization Board which will discuss the situation and make any long-term decisions which seem necessary. Present thinking indicates that established producers will be asked to expand first, but don't count out new primary producers.

Mr. Flemming said that fast tax write-off might be enough to encourage the new expenditure, but if it isn't, government purchase commitments should turn the trick.

Simple Solution—As for the current troubles, there seems to be only one solution: More metal from stockpile deliveries. And both producers and users are pushing hard for that move. At a meeting with the Business & Defense Services Administration officials earlier this month, the primary producers sided with their customers in requesting that the government release more stockpile-destined metal to ease the pinch. They promised an equitable delivery to all users, especially the independent fabricators.

This attitude on the part of the producers might easily be traced to the pressure small businesses are putting on the House Small Business subcommittee investigating the shortage. The Aluminum Extruders Council, appearing before that committee, made charges that the "Big Three" producers divvied most of the 75,000 tons among their own fabricating facilities. The extruders especially claim they were left out, and they want some action to assure themselves of participation in any future doles. Specifically, they want an extra 25,000 tons in the second quarter and 100,000 tons in the second half.

Producers Ask Less—It is not stated just what amount the producers recommended be released, but unofficial word places it at 45,000 tons for the third quarter. This week may see action on these requests.

Aluminum producers also joined secondary smelters in asking ODM to limit exports of scrap in the third quarter to 500 tons a month.

Copper Scrap Plays Follow the Leader

(Weekly Averages)

*Bureau of Labor Statistics.
**London Metal Exchange.

Zinc Use Sets Record

Zinc goes merrily on its way. Bureau of Mines figures for March confirm what most industry men already knew—that consumption as well as production is clipping along at a record pace. A total of 96,000 tons was used during the month, eclipsing the old mark set in March, 1953, by about 2 per cent. The new mark was 20 per cent above February, which was considered good even for a short month. And for the first time, galvanizing was not kingpin among users. Casters took the honors by a hair. Galvanizing increased its take from 31,601 tons in February to 37,648 in March. But diecasters, and related users of zinc-base alloys, jumped from 31,254 tons to 37,682 tons. Industry talk hints at new records for April and May.

Meanwhile, pressure mounts among producers for another price increase to 13 cents a pound. In its second quarter report, American Zinc, Lead & Smelting Co. adds its voice to the growing dissatisfaction over the price of zinc. The company has closed some mines that cannot operate economically at the present level.

Copper in the Doldrums

The copper industry seems to be waiting for a new development to get excited about. Price on both sides of the ocean seems to be firm as of this writing: 36 cents here and an equivalent 40-41 cents in London. The break may come as usual from London, where the market is faced with three levels: The London Metal Exchange, mentioned above; the Rhodesian Selective Trust group's set price of 35 cents; and the average price at which the government is disposing of the rest of the government-released metal. Most observers believe the inequality cannot last, and many are betting on the LME.

As that quotation goes up and down, so does the U. S. scrap price (see chart). Except for some time lags, the influence of London appears to be direct. The domestic scrap market, being removed from the direct stimulus of the fluctuation, seems to be more buoyant. The colored peaks are relatively higher and the valleys not so deep as in the black line.

Market Memos

- Harvey Machine Co. is considering a suit against the government for failing to go through with a contractual obligation to build a power project at The Dalles in Oregon. Harvey would have used the power for a proposed aluminum reduction plant. The contract was signed during the Truman era.
- Magnesium casting shipments for March were 19 per cent above the February figure, but the first-quarter total was still 9 tons under the same quarter last year.

Newport Steel .....THE CUSTOMERS' MILL

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

Long-term planning is continuous at Newport Steel—designed to meet your most exacting requirements. Greatly expanded and modernized facilities already have resulted, but even before one major project is completed, plans for additional improvements are under way. Equally essential to customer satisfaction is the spirit in which the Newport organization strives constantly for still further precision of operations, quality of product, dependability of service. Through the years, Newport Steel will dedicate itself to serve always as *the customers' mill*. Check this list of products now, and contact Newport before you buy.

ECONOMICAL WATERAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads, 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $301-$303 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "Y" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$130, nom., per troy oz.

Palladium: $17-$20 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$56 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 90.16 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 91.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloy, 26.25-28.00; No. 12 foundry alloy (No. 2 grade), 25.50-26.50; 5% silicon alloy, 0.60 Cu max, 27.75-28.00; 13 alloy, 0.60 Cu max, 27.75-28.00; 195 alloy, 27.75-28.00; 108 alloy, 26.00-26.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.50-27.25; grade 2, 25.50-26.25; grade 3, 24.50-25.25; grade 4, 24.00-24.75.

Brass Ingot: Red brass No. 115, 35.50; tin bronze No. 225, 47.50; No. 245, 40.75; high-leaded tin bronze No. 305, 39.00, No. 1 yellow, No. 405, 30.75; manganese bronze No. 421, 33.25.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circlet
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 11.00-11.50; borings and turnings, 7.50-8.00; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

BRASS MILL PRICES

	MILL PRODUCTS a			SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.06	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 30.00-31.00; No. 2 copper, 29.00-29.50; light copper, 27.00-27.50; No. 1 composition red brass, 24.50-25.00; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00; No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50-16.50; heavy yellow brass, 16.50-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 18.00-18.50; cocks and faucets, 19.50-20.50; brass pipe, 19.50-20.50.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings, 28.00-36.00; old sheets, 26.00-32.00; turnings, 21.00; rods, 28.00-36.00.
Nickel: Sheets and clips 57.00-70.00; rolled anodes 57.00-70.00; turnings 40.00-55.00; rod ends 57.00-70.00.
Tin: No. 1 pewter 50.00-59.00; block tin pipe 75.00-77.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.50-5.00; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 17.50-18.00; 3003 clippings, 17.50-18.50; 6151 clippings, 17.50-18.00; 5052 clippings, 17.50-18.00; 2014 clippings, 17.00-17.50; 2017 clippings, 17.00-17.50; 2024 clippings, 17.00-17.50; mixed clippings, 17.00-18.00; old sheet, 14.50-15.00; old cast, 14.50-15.00; clean old cable (free of steel), 17.50-18.00; borings and turnings, 15.00-16.00.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper and Brass: No. 1 copper, 34.00; No. 2 copper, 32.50; light copper, 30.75; refinery brass (60% copper) per dry copper content, 30.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper and Brass: No. 1 copper, 33.50-34.00; No. 2 copper, 32.00-32.50; light copper, 30.25-30.75; No. 1 composition borings, 26.50; No. 1 composition solids, 27.00; heavy yellow brass solids, 20.50; yellow brass turnings, 19.50-20.50; radiators, 21.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

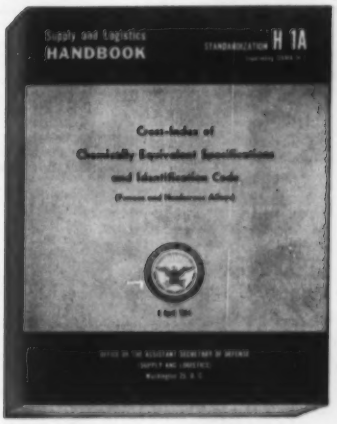
ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.095; 200-499 lb, $1.08; 500-999 lb, $1.075; 1000 lb or more, $1.07.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.10; 100-600 lb, 55.90; 700-1900 lb, 53.40; 2000-9900 lb, 51.70; 10,000 lb or more, 50.60.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.558; 50 lb, $1.218; 100-300 lb, $1.068; 400-900 lb, $1.043; 1000-1900 lb, $1.019; 2000-4900 lb, 98.20; 5000-19,900 lb, 92.10; 20,000 lb or more, 84.00.
Stannous Sulphate: Less than 50 lb, $1.258; 50 lb, 95.80; 100-1900 lb, 93.80; 2000 lb or more, 91.80.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

More Help With Metal Specs



YOU NEED all the help you can get these days to untangle metal specifications.

You can get it from the new revised cross-index of chemically equivalent specifications for steel and nonferrous alloys, just published by Department of Defense.

It's a 345-page reference book that defines and compares the compositions of all metal specifications. It will save you valuable production and engineering time by curbing confusion about the various specification systems.

Scope—Listed and cross-indexed are specifications of Army, Air Force, Navy, AISI, Dept. of Defense (MIL and JAN), ASTM, SAE, Aeronautical Standard Group, General Services Administration (Federal), Aeronautical Material (SAE) and Aluminum producers.

Metals included are iron and steel, copper, nickel, cobalt, titanium, lead, tin, silver, aluminum, magnesium, zinc, bismuth, cadmium, antimony, gold, platinum and their alloys.

Up-To-Date—The handbook is a revision of a previous cross-index completed late in 1952. A realization of the need of the metalworking industry for a complete rundown on metal specifications led STEEL to undertake publication of its Specifications Handbook based on the government's 1952 edition. Over 20,000 copies of STEEL's handbook were distributed, but the supply is exhausted; and because of revisions included in the new edition, it will not be republished.

How—To keep posted on the latest information on specifications, you can obtain copies of the new government handbook through STEEL's Readers' Service department, or from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Cost is $1.75 per copy, postpaid, payment with order.

When ordering from the Government Printing Office, ask for Supply and Logistics Handbook H 1A, "Cross-Index of Chemically Equivalent Specifications and Identification Code." When ordering through STEEL, use coupon below.

STEEL
Readers' Service Dept. • Penton Building • Cleveland 13, Ohio

Send me_____copies of the government's Cross-Index on metals specification at $1.75 per copy, postpaid. **Enclosed is my check for**_____.

Name ..... **Title** .....
Company .....
Address .....
City & State .....
(Please print or type)

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company. Key on page 101. Key to footnotes, page 103.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$66.00
Houston 85 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
LoneStar,Tex. L6 ....70.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ..64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston 85 .....83.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14. 78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston 85 .....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14. 86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
LoneStar,Tex. L6 .....4.30
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston 85 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. 85 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 .....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ....5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston 85 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. 85 .....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.00
Phoenixville,Pa. 4.20
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 .....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston 85 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston 85 .....6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. 85 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14.6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 .....4.225
Clairton, Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....4.225
Houston 85 .....4.275
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 .....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Coatesville,Pa. I.7 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston 85 .....6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston 85 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 .....5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 ....5.275
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ...4.55
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston 85 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. 85 .....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago R2,U5,W14 ..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7 .....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 ....6.125
FairlessHills,Pa. U5 ...5.225
Gary,Ind. U5 .....5.075
Houston 85 .....5.325
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. 85 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Loaded Alloy

Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston 85 .....6.70
Ind.Harb.,Ind. I-2, Y1 ..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. 85 .....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco 87 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston 85 .....5.45
KansasCity,Mo. 85 .....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12,R2..5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 .....5.40
GreenBay, Wis. F7 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 .....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.625
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2,M13..6.625
Hartford,Conn. R2 .....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ....6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 .....6.625
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ....6.925
Youngstown F3, Y1....6.625

BARS, C.F. Loaded Alloy

Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.525
Cleveland C20 .....7.525
Monaca,Pa. S17 .....7.525
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston 85 .....4.55

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.15
Dravosburg,Pa. U5 .....4.05
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
FairlessHills,Pa. U5 ....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ...4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ....4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ...4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16.....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Dravosburg,Pa. U5 .....6.10
Ecorse,Mich. G5 .....6.20
Fairfield,Ala T2 .....6.10
FairlessHills,Pa. U5 ....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...5.00
Dravosburg,Pa. U5 ....4.95
Ecorse,Mich. G5 .....5.05
Fairfield,Ala. T2 .....4.95
FairlessHills,Pa. U5 ....5.00
Follansbee,W.Va. F4 ...4.95
Fontana, Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 .....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 ....4.95
Newport,Ky. N9 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Dravosburg,Pa. U5 ....7.50
Ecorse,Mich. G5 .....7.60
FairlessHills,Pa. U5 ....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1 ..7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.45

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ...5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Dravosburg,Pa. U5 ...5.45†
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45‡
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ...6.20*
SparrowsPt.,Md. B2 ...5.45‡
Warren,O. R2 .....5.45†
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.20
SparrowsPoint(30) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Dravosburg,Pa. U5 ....5.85
Kokomo,Ind. C16 .....6.20
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ....5.375
Cleveland R2 .....5.375
Dravosburg,Pa. U5 ....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..5.70
KansasCity,Kans. S5 ...6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U8 .....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ¼-1" B2 ..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ...4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 ....4.30
Marion,O.(3) P11 .....4.20
Moline,Ill(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(8.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(8.R.) L5 ....10.85
McK.Rks.(D.R.) L5 ...14.75
McK.Rks.(Staybolt) L5 16.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelson Steel & Wire Co.
N6 NewEng.High Carb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.50
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J. C18	5.75
Wallingford,Conn. W2	6.20
Warren,O. R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
New York W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½¢ lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95§	12.50§	13.00§	14.00§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70§

*Semiprocessed. †Fully processed only. §Coils annealed; semiprocessed ½c lower. ‡Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.20
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.75
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.30
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massilion,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	.137
Aliquippa,Pa. J5	.137
Atlanta A11	.139
Bartonville,Ill. K4	.139
Chicago,Ill W13	.137
Cleveland A9	.142
Crawfordsville,Ind. M8	.139
Donora,Pa. A7	.137
Duluth,Minn. A7	.137
Fairfield,Ala. T2	.137
Galveston,Tex. D7	.145
Houston,Tex. S5	.142
Johnstown,Pa. B2	.137
Joliet,Ill. A7	.137
KansasCity,Mo. S5	.142
Kokomo,Ind. C16	.139
Minnequa,Colo. C10	.142
Monessen,Pa. P7	.137
Pittsburg,Calif. C11	.156
Rankin,Pa. A7	.137
So.Chicago,Ill. R2	.137
SparrowsPt.,Md. B2	.139
Sterling,Ill.(1) N15	.137
Worcester,Mass. A7	.143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	.138
Atlanta A11	.140
Bartonville,Ill. K4	.139
Crawfordsville,Ind. M8	.139
Donora,Pa. A7	.138
Duluth,Minn. A7	.138
Fairfield,Ala. T2	.138
Johnstown,Pa. B2	.138
Joliet,Ill A7	.138
Kokomo,Ind. C16	.139
Minnequa,Colo. C10	.142
Monessen,Pa. P7	.137
Pittsburg,Calif. C11	.157
Rankin,Pa. A7	.138
SparrowsPt.,Md. B2	.140
Sterling,Ill.(1) N15	.138
Worcester,Mass. A7	.144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$8.77
Buffalo W12	8.77
Donora,Pa. A7	8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Minnnequa,Colo. C10	9.02
So.Chicago,Ill. R2	8.77

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.05
Buffalo W12	9.05
Donora,Pa. A7	9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Minnequa,Colo. C10	9.30
So.Chicago,Ill. R2	9.05

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.10
Buffalo W12	9.10
Donora,Pa. A7	9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10
Minnequa,Colo. C10	9.35
So.Chicago,Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.155
Atlanta A11	.157
Bartonville,Ill. K4	.157
Crawfordsville,Ind. M8	.157
Donora,Pa. A7	.155
Duluth,Minn. A7	.156
Fairfield,Ala. T2	.155
Joliet,Ill. A7	.155
Houston S5	.160
KansasCity,Mo. S5	.160
Kokomo,Ind. C16	.157
Minnequa,Colo. C10	.160
Pittsburg,Calif. C11	.179
So.SanFran.,Calif. C10	.179
SparrowsPoint,Md. B2	.157
Sterling,Ill.(1) N15	.155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.159**
Aliquippa J5	.156§
Atlanta A11	.164
Bartonville,Ill. K4	.165
Crawfordsville,Ind. M8	.164
Donora,Pa. A7	.159†
Duluth,Minn. A7	.159†
Fairfield,Ala. T2	.159†
Houston,Tex. S5	.164†
Johnstown,Pa. B2	.162*
Joliet,Ill. A7	.159†
KansasCity,Mo. S5	.164†
Kokomo,Ind. C16	.161†
Minnequa,Colo. C10	.164**
Monessen,Pa. P7	.162
Pittsburg,Calif. C11	.179†
Rankin,Pa. A7	.159†
So.Chicago,Ill. R2	.159**
So.SanFrancisco C10	.179**
SparrowsPoint,Md. B2	.164*
Sterling,Ill.(1) N15	.163

WOVEN Fence, 9-15 Ga. Col.

Ala.City,Ala. R2	.146**
Ala.City, 17 ga. R2	.241**
Ala.City, 18 ga. R2	.251**
Aliq'ppa,Pa. 9-14½ga. J5	149§
Atlanta A11	.151
Bartonville,Ill. K4	.152
Crawfordsville,Ind. M8	.151
Donora,Pa. A7	.146†
Duluth,Minn. A7	.146†
Fairfield,Ala. T2	.146†
Houston,Tex. S5	.151†
Johnstown,Pa.(43) B2	.149
Joliet,Ill. A7	.146†
KansasCity,Mo. S5	.151†
Kokomo,Ind. C16	.148†
Minnequa,Colo. C10	.151**
Monessen,Pa. 9 ga. P17	.149
Pittsburg,Calif. C11	.169†
Rankin,Pa. A7	.146†
So.Chicago,Ill. R2	.146**
Sterling,Ill.(1) N15	.150

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawf'dsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425§
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.575
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
Johnstown B2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer,Mass. W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
So.S.Fran. C10	7.85 8.25**
Spar'wsPt.B2(48)	7.00 7.55*
Sterling(1)(48) N15	6.90 7.475
Struthers,O.(48) Y1	6.90 7.40‡
Worcester,Mass. A7	7.20 ....

*Based on 11c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive	58
1⅛" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	*33.00-43.00*
Bronze, 5000-lb lots	*54.25-57.25*
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	*94.00*
Nickel-Silver, 5000-lb lots	*49.75-57.25*
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	*17.75-21.50‡*
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh	*4.30-4.40*
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16": 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 2 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.35c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9 14½ Ga.
(48) 6 7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		8c		8c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. P6	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.66		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	34.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Josyln Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base Cold Rolled 10%	Strip, Carbon Base Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.28	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...		4.030
18.25	4.25	1	4.75	...		2.245-2.415
18	4	2	9	...		2.615
18	4	2	....	...		1.705
18	4	1	....	...		1.540
14	4	2	5	...		2.185
13.75	3.75	2	5	...		2.185
13.5	4	3	....	...		1.805
9	3.5	..	....	...		1.115
6	4	2	....	5		1.045
6	4	3	....	6		1.290
1.5	4	1	....	8.5		0.900

Tool steel producers include: A4, A5, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
Alabama City, Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda, N.Y. W12	56.00	56.50	57.00	57.50
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse, N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon, Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron, O., deld.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	56.00	56.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	56.00	56.50	59.00	59.50
Chester, Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton, Pa. B2	56.00	56.50	59.00	59.50
Swedeland, Pa. A3	56.00	56.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy, N.Y. R2	56.00	56.50	59.00	59.50
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.84	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	....	58.16	58.16	58.66
Verona, Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
Lone Star, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	56.00	59.00	59.00	....
Rockwood, Tenn. T2	....	52.50*	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. G2, J1	$65.00
Buffalo H1	66.26

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$80.50
Keokuk, Iowa, (Open-hearth & Fdry, freight allowed K2)	83.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	83.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$81.00
Lyles, Tenn. T3	78.00
Rockwood, Tenn. T3	79.06
Steelton, Pa. B2	64.00
Philadelphia, deld.	67.56
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††*		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02[4]	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.45	8.45
Boston	7.23	8.23	9.57	45.28[5]	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.84	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.36	7.36	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.60	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73[4]	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[3]	6.96	8.80	6.74	7.86[3]	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64[3]	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.55	8.95	9.45	51.65	7.80	...	7.35	10.05	13.35	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.15	....	7.80	...	7.80	10.85[4]	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.06	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

Production Increased 30%

Shown here is a 6000 lb. Chambersburg Steam Drop Hammer and a No. 200 Chambersburg Steel Side Trimming Press installed in a forge shop specializing in railroad car parts, gear blanks and general job forging. A 2000 lb. hammer and a No. 100 Trimmer are also installed. Hammers operate on air.

In replacing older hammers, the Chambersburgs were selected for the accuracy and quality of their manufacture. Experience to date shows maintenance costs are lowered, rejects are fewer, less down time is required, and as a result management figures production is up 30%!

If you are interested in getting similar results in your own shop, write for a copy of Bulletin 55-L-4.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

"THE HAMMER BUILDERS"

Galvanizing Goes Continuous

Who Has the Lines, Where and How Much

In Operation

COMPANIES	NO. LINES	LOCATION	ANNUAL CAPACITY (net tons)
Armco Steel Corp.	2	Ashland, Ky.	216,000
Armco Steel Corp.	2*	Butler, Pa.	76,000
Armco Steel Corp.	2	Middletown, O.	194,000
Bethlehem Steel Co.	1	Sparrows Point, Md.	84,000
Columbia-Geneva Steel Div., U. S. Steel Corp.	1	Pittsburg, Calif.	97,660
Inland Steel Co.	2	Indiana Harbor, Ind.	130,000
Republic Steel Corp.	1	Warren, O.	144,000
Sharon Steel Corp.	1	Farrell, Pa.	36,000
Tennessee Coal & Iron Div., U. S. Steel Corp.	3	Fairfield, Ala.	159,600
U. S. Steel Corp.	2	Gary, Ind.	147,700
U. S. Steel Corp.	2	Irvin Works, Dravosburg, Pa.	147,700
Weirton Steel Co.	2	Weirton, W. Va.	140,000
Wheeling Steel Corp.	1	Martins Ferry, O.	144,000
Total	22		1,716,660

Under Construction

Bethlehem Steel Co. (Completion date: Not determined)	2	Sparrows Point, Md.	168,000
Inland Steel Co. (Completion date: Dec., 1955)	1	Indiana Harbor, Ind.	80,000
Jones & Laughlin Steel Corp. (Completion date: 1st qtr., 1956)	1	Pittsburgh	90,000— 100,000
Reeves Steel & Mfg. Co. (Completion date: Oct., 1955)	1	Dover, O.	120,000
Republic Steel Corp. (Completion date: Late 1956)	1	Gadsden, Ala.	144,000
Wheeling Steel Corp. (Completion date: Late summer)	1	Martins Ferry, O.	216,000
Total	7		823,000

Planned

Armco Steel Corp. (Completion date: 1956)	1	Middletown, O.	Undetermined

Considered

Granite City Steel Co.	1	Granite City, Ill.	100,000
Total in operation, under construction, planned and considered	31		About 2,700,000

*Currently being used for aluminizing.

■ HALF the nation's capacity for making galvanized sheets is now in the new, continuous hot-dipped galvanizing lines. Within another year, they'll account for three-fourths or more of capacity.

The new lines, which are replacing the old method of hot dipping individual sheets, already total 1,716,660 net tons of annual capacity. Lines under construction have a capacity of 823,000 tons; those planned or considered total nearly another 200,000 tons. In another year the capacity of continuous hot-dipped galvanizing lines will be about 2.7 million net tons (see table).

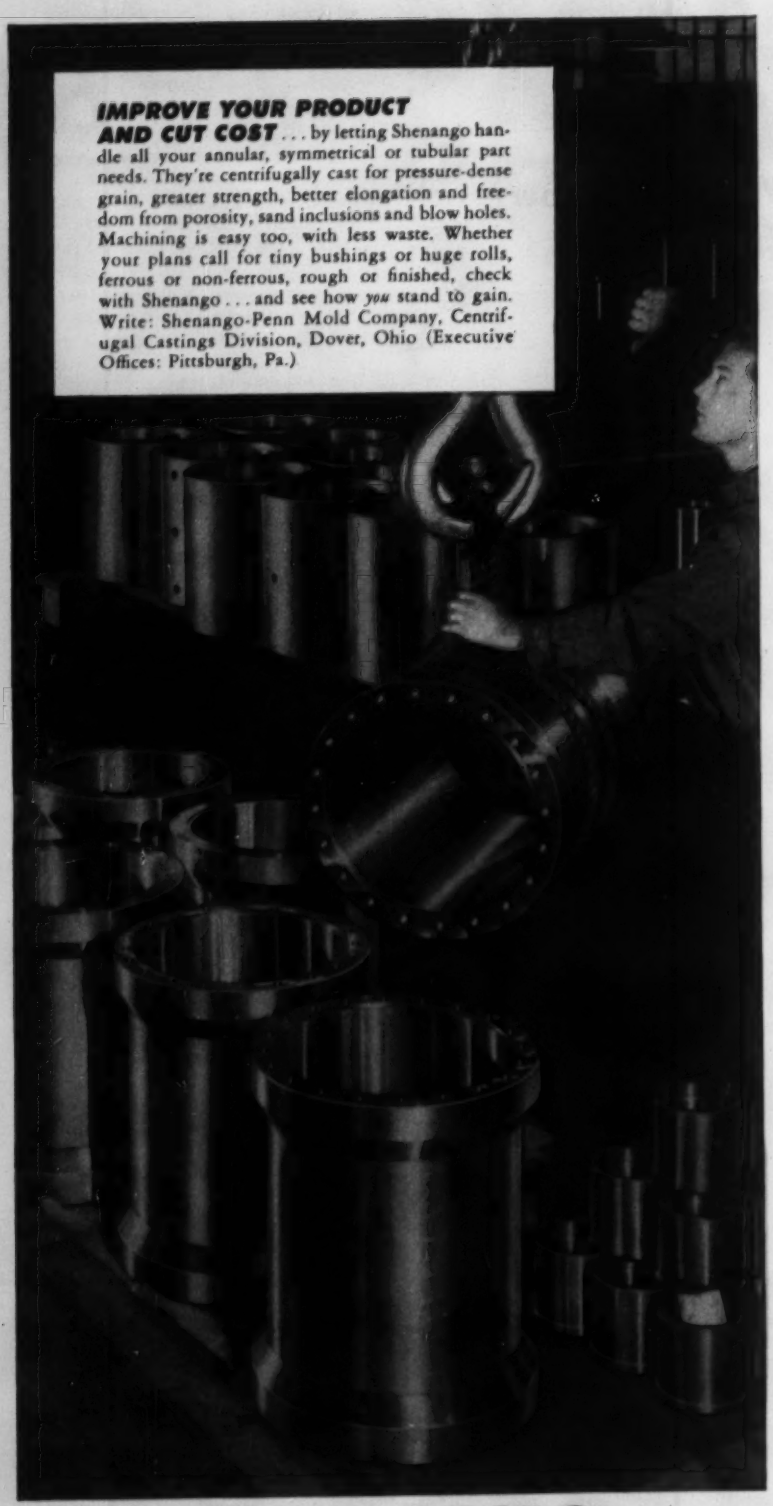
Latest Data—Our sheet galvanizing capacity on Jan. 1, 1954, was 3,311,620 net tons (the latest figure available from the American Iron & Steel Institute). And that figure includes all methods of galvanizing—continuous hot dipped, conventional (noncontinuous hot dipped) and electrogalvanized.

Total capacity now probably is more than 3,311,620 tons. All the old galvanizing pots have not been removed, and some of them still would figure into active capacity. It's only a matter of time, however, until many of them will be removed. Inland Steel Co. tore out its galvanizing pots at its Indiana Harbor, Ind., Works when it brought in its second continuous hot-dipped galvanizing line. U. S. Steel Corp. and Armco Steel Corp. also discontinued their galvanizing pots.

Inclined To Expand—Even if many of the old galvanizing pots are removed, galvanizing capacity is likely to be more than it was on Jan. 1, 1954. Because of the sustained heavy demand for galvanized sheets, and in line with the steel industry's expansion, mills are inclined to boost their capacity when replacing their old galvanizing pots with continuous galvanizing lines.

Inland Steel, for instance, had 180,000 net tons of sheet galvanizing capacity on Jan. 1, 1954. Its sheet galvanizing capacity now is entirely in two continuous hot-dipping lines, which can produce 130,000 tons annually. When its third line comes into operation late this year, Inland will have 210,000 tons of capacity. Then, Inland will have 30,000 tons more capacity than it had on Jan. 1, 1954. Similarly, Armco Steel Corp. had 414,000 tons of sheet galvanizing capacity on that date. Now, it has 486,000 tons of capacity in its continuous lines, and it is going to add a line at Middletown, O.

Boosting Demand—The continuous hot-dip galvanizing lines are expanding demand for galvanized sheets. The lines turn out a sheet suited for stamping and drawing. The



IMPROVE YOUR PRODUCT AND CUT COST . . . by letting Shenango handle all your annular, symmetrical or tubular part needs. They're centrifugally cast for pressure-dense grain, greater strength, better elongation and freedom from porosity, sand inclusions and blow holes. Machining is easy too, with less waste. Whether your plans call for tiny bushings or huge rolls, ferrous or non-ferrous, rough or finished, check with Shenango . . . and see how *you* stand to gain. Write: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.)

SHENANGO CENTRIFUGAL CASTINGS

COPPER, TIN, LEAD, ZINC BRONZES · MONEL METAL
ALUMINUM AND MANGANESE BRONZES · NI-RESIST · MEEHANITE METAL

zinc coating is remarkably adherent. The sheet lends itself to high-speed consuming operations; it can be obtained in coil form and fed continuously into automatic equipment. In the old, noncontinuous hot-dipped process, only sheets in cut lengths could be supplied.

The new technology of producing galvanized sheets by the continuous hot-dipped method does not eliminate all problems for producers. One headache is discoloration, known as wet storage stain, of galvanized sheets.

Beware of Moisture—This staining can happen when piled sheets or nested formed items become wet from rain or condensation in shipment or storage. If trapped moisture remains long enough, wet storage stain may become so severe that the effective life of the sheet may be reduced considerably.

Mills are working on this problem. They are seeking a suitable coating for the galvanized sheets. The coating must be colorless; it must not interfere with soldering of the sheet; and it must be inexpensive. Test lots of galvanized sheets bearing experimental coatings already have gone out into the field.

AISI Suggests—Meanwhile, the American Iron & Steel Institute's committee on galvanized steel sheet development makes these suggestions: 1. Specify suitable packaging

What's in a Name?

Zinc-Coated Sheets

Hot-Dipped Process

NAME	PRODUCER
Bethcon Continuous Galvanized	Bethlehem Steel Co.
Galvanite	Republic Steel Corp.
Galvannealed	Sharon Steel Corp.
	Continental Steel Corp.
	Newport Steel Corp.
	Republic Steel Corp.
	U. S. Steel Corp.
SofTite	Wheeling Steel Corp.
Ti-Co	Inland Steel Co.
USS Paint Bond*	U. S. Steel Corp.
Zincgrip	Armco Steel Corp.
Zincgrip Paintgrip*	Armco Steel Corp.

Electrogalvanized Process

Cold-Rolled Paintgrip	Armco Steel Corp.
Electro Flashcote	Republic Steel Corp.
Electro Paintlok	Republic Steel Corp.
Electro Zincbond	Republic Steel Corp.
Paint-Rite	Weirton Steel Co.
Weirzin	Weirton Steel Co.

*Chemically treated for paint adherence.

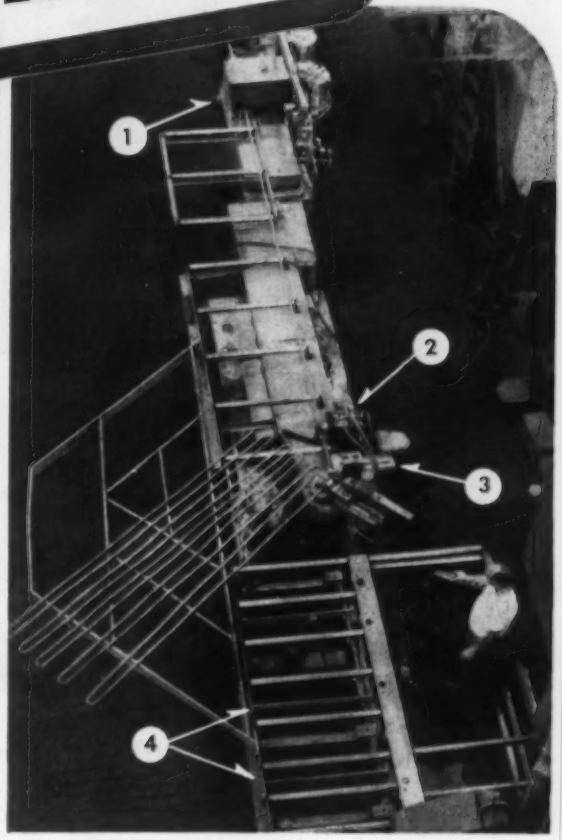
Automation IN COIL BENDING

How Serpentine Coils Are Now Produced in One Continuous Operation on PINES Size 1¼ Production Bender

● At Carrier Corporation, Syracuse, N. Y., large serpentine air conditioning coils are now completely formed in one, continuous bending operation on a Pines Size 1¼ Production Bender equipped with a flash welder, automatic feed roll, and turn-over fixture. By former methods, three machines were required to meet production needs, and after bending, from 64 to 128 welds were necessary to fabricate a complete cooling unit. In addition to the slow, inconvenient welding procedure, a considerable amount of stock cutting and work handling was required.

COILS NOW PRODUCED AT 200 BENDS PER HOUR

Today, with the new Pines equipment, complete serpentine coils are now formed with little work handling. Straight lengths of stock are butt-welded together before bending which permits completing the coils in one, continuous operation. This method reduces the number of welds and stock cutting because long lengths of stock are used. Scrap losses are reduced as much as 80%, and since the entire operation is mechanized, work handling is substantially reduced. The result — complete coils are now produced on one machine with two operators at a production rate of 200 bends per hour.



▲ Over-all view of Pines installation at Carrier Corp., Syracuse. Handles standard pipe ranging from ¾" up to 1¼" sizes. The unit combines (1) welder, (2) feed roll, (3) bender, and (4) turn-over fixture.

◀ Closeup view showing automatic feed roll and tooling. Hinged clamp die with angular cam surface and mating plate permits clamping workpiece without interfering with formed coil. Long, horizontal clamp holds ends of coils to prevent distortion during sweep of bending arm.

WRITE FOR *Free* DATA SHEETS

For more information on latest developments in production bending, write for copies of "Pines News". Describes and illustrates how production bending is helping cut manufacturing costs on a wide variety of jobs.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery · 652 WALNUT · AURORA, ILLINOIS

PRODUCTION BENDING · DEBURRING · CHAMFERING MACHINERY

ARCOS FOR FINEST QUALITY WELDS

Cooking up some profitable benefits for food processors

Processing tomato juice or apple sauce . . . vinegar or chicken soup—cooking kettles *must* be "stain-proof". Stainless welds in particular must be chemically "right", physically sound. On both counts, because of careful quality control, Arcos Stainless Rods and Electrodes produce welds with these requirements.

If corrosion resistant welds are essential to the processing equipment you make or use, you'll profit with Arcos. Here's why: Expensive trial-and-error selection is avoided. There's a properly formulated grade for each job. Costly rewelding is eliminated. The rigid quality standards in manufacture assure you consistent and dependable weld metal. And Arcos technical service adds extra promise of the results you want. On *any* corrosion resistant welding problem, get in touch with your Arcos distributor or Arcos Corporation, 1500 S. 50th St., Phila. 43, Pa.

WELD WITH ARCOS STAINLESS RODS AND ELECTRODES

for protecting the product in transit. 2. Inspect for moisture upon receipt, and if moisture is present, dry at once. 3. Don't permit moisture from weather, condensation or other sources to remain between sheets or formed sections in piles when stored in warehouses or in the field prior to application. 4. Store in a warm, dry place. Stand formed roofing and siding on end on wooden strips or blocks, and separate sheets to allow moisture to drain off and air to circulate.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

Another Victim of Progress

Light-gage Toncan Iron sheets produced by Republic Steel Corp. have become a victim of rolling mill progress, L. S. Hamaker, general manager of sales, reported at a Cleveland meeting.

Republic discontinued manufacture of this product in gages lighter than 13.

This product originated on the old hand rolling mills. There it was rolled down as thin as desired while hot. Upon abandonment of hand mills, manufacture of the product was transferred to their successor —the continuous mills.

The continuous hot-rolling mill does not reduce the thickness of steel as much as the old hand mills. Republic tried to use its continuous cold-rolling mills to further reduce the thickness of the Toncan Iron sheets to the light gages, but results were unsatisfactory. Cold reduction work hardened the sheets because of their copper and molybdenum content. The cold-rolled sheets couldn't be annealed successfully. Their surfaces were so clean they stuck together; they turned into a lump of steel. Sheets from the old hand mills had enough scale on their surfaces to prevent sticking during annealing.

Now, Republic will produce Toncan Iron sheets only in the thicknesses provided by the continuous hot-rolling mill. Output will continue to include Toncan Iron culvert sheets 16 gage and heavier (a product that is galvanized).

Eliminated are galvanized and galvannealed flat and formed Toncan sheets and cold-rolled Toncan sheets. Those were products of the cold-rolling mill.

Republic will continue to supply copper steel sheets.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 101 & 102

Third-quarter sheet orders will keep mills working near peak capacity through the summer. Eastern producers are out of the market on tonnage for shipment through August.

Suppliers of automotive parts and components are placing orders in New England for sheets and strip required for 1956 models. At the same time, moderate cutbacks have been made at Detroit on primary cold-finished carbon sheets. Slack in cold-finished, carbon, flat-rolled steel for automobile assembly is likely to be of short duration, barring production suspensions.

Steel Bars . . .

Bar Prices, Page 100

Hot-rolled carbon bar sellers are booked well into August. In fact, some have only a limited tonnage left for the third quarter, none for new accounts. Cold-finished carbon bar deliveries are available in July, where hot stock is on hand.

Consumers of hot and cold-alloy bars can obtain some tonnage for delivery in late July. Sales of alloy bars to farm equipment producers are active.

Plates . . .

Plate Prices, Page 100

Plates remain a "tight" commodity, with deliveries lengthening and orders being taken no earlier than late third quarter. How long this situation will prevail depends to some extent on the volume of sheet orders. If demand tapers in the third quarter, more ingots will be available for plate mills.

While plate consumers have accumulated some inventories, demand continues brisk. Specifications for tanks and various building requirements are more than holding their own. Considerable tonnage is going into general purpose industrial equipment.

Most eastern platemakers are booked through August on sheared plates. Mills could book more tonnage, but they are wary of tangled schedules and possible carryovers. Universal plate can be bought for late July or early August delivery.

One midwestern buyer reports that shipments to him are one month behind schedule and that there's talk of canceling July orders by mills in an effort to catch up. At least one large eastern producer has delayed opening of books for September in

(*Please turn to page* 114)

ARCOS FOR FINEST QUALITY WELDS

NEW aluminum spooled wire offers these advantages for inert gas welding

From the standpoint of economy and speed, the welding of aluminum by inert gas produces good welds, providing the aluminum wire is properly prepared for this process. Arcos has established the controls necessary to assure the high quality required for good welds. That's why it will pay you to specify Arcos ALUMAR Spooled Wire. Its uniform, clean finish gives better conductivity and arc stability. Each batch is pre-tested to assure you weld metal characteristics within a critically controlled range.

Write today for our new Bulletin on the complete line of Aluminum Wire—Spooled, Coiled, Straightened and Cut. For every aluminum welding job, Arcos offers the wire you need for the results you want. Arcos Corporation, 1500 South 50th Street, Philadelphia 43, Pennsylvania.

WELD WITH ARCOS

ALUMINUM AND STAINLESS SPOOLED WIRE

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.55c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 35-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%. Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 34.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon, f.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 5-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primes and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 88c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40 Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered, Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c. f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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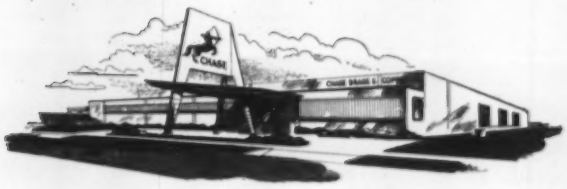
IS THE



PLACE

Illustrated above: Just three of the 25 efficient Chase warehouses dotting the nation.

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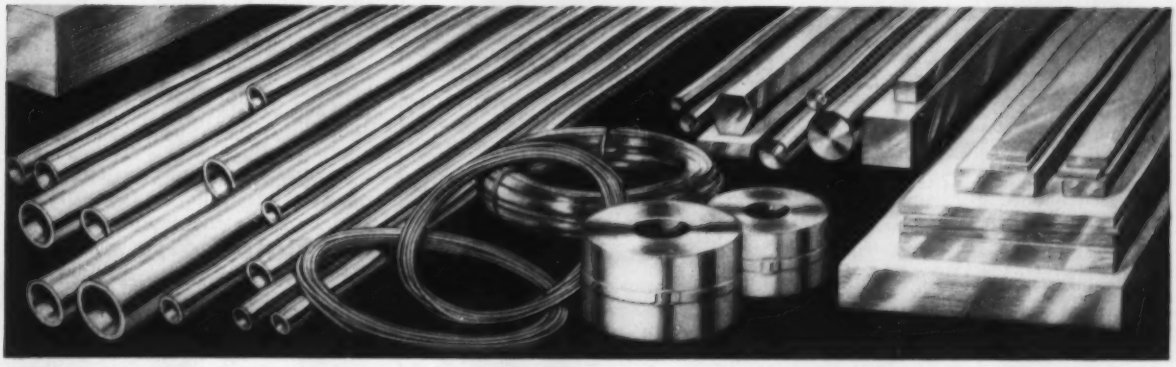

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Boston	Dallas	Indianapolis	Newark	Providence	Waterbury
Charlotte†	Denver	Kansas City, Mo.	New Orleans	Rochester†	(†sales office only)

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haideman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Potsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Peria, Ark., $100; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Bilimeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

Inches Diam	Inches Length	Per 100 lb
GRAPHITE		
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5¼	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25
CARBON		
8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

(*Concluded from page* 111)

an effort to keep orders in balance with production schedules.

Navy requirements are contributing considerably to the over-all strong demand for plates. A large portion of these requirements is in alloy specialties. The Maritime Administration, Washington, closes bids July 29 on two small tankers and Aug. 12 on three cargo ships.

Wire . . .

Wire Prices, Pages 102 & 103

Wire orders for the third quarter are heavier. Bookings on some finished products extend through that quarter. Buying for most part is for specific needs to meet heavier consumption.

While shipments through the balance of this quarter include some price-hedge tonnage, inventory coverage is not heavy.

The market for manufacturers wire continues strong. Consumers in the automotive, appliance and bedding industries are among those ordering largest tonnages. Seasonal influences are boosting sales of welded wire fabric for construction.

Demand for merchant trade products, especially fencing, has passed its seasonal peak. Output is expected to decline through the summer and to turn upward in the fall. Unfavorable weather and the poor crop outlook are the chief market factors in some sections of the West. An exception to the general decline in merchant product business is on the East Coast where an appreciable gain in demand is noted.

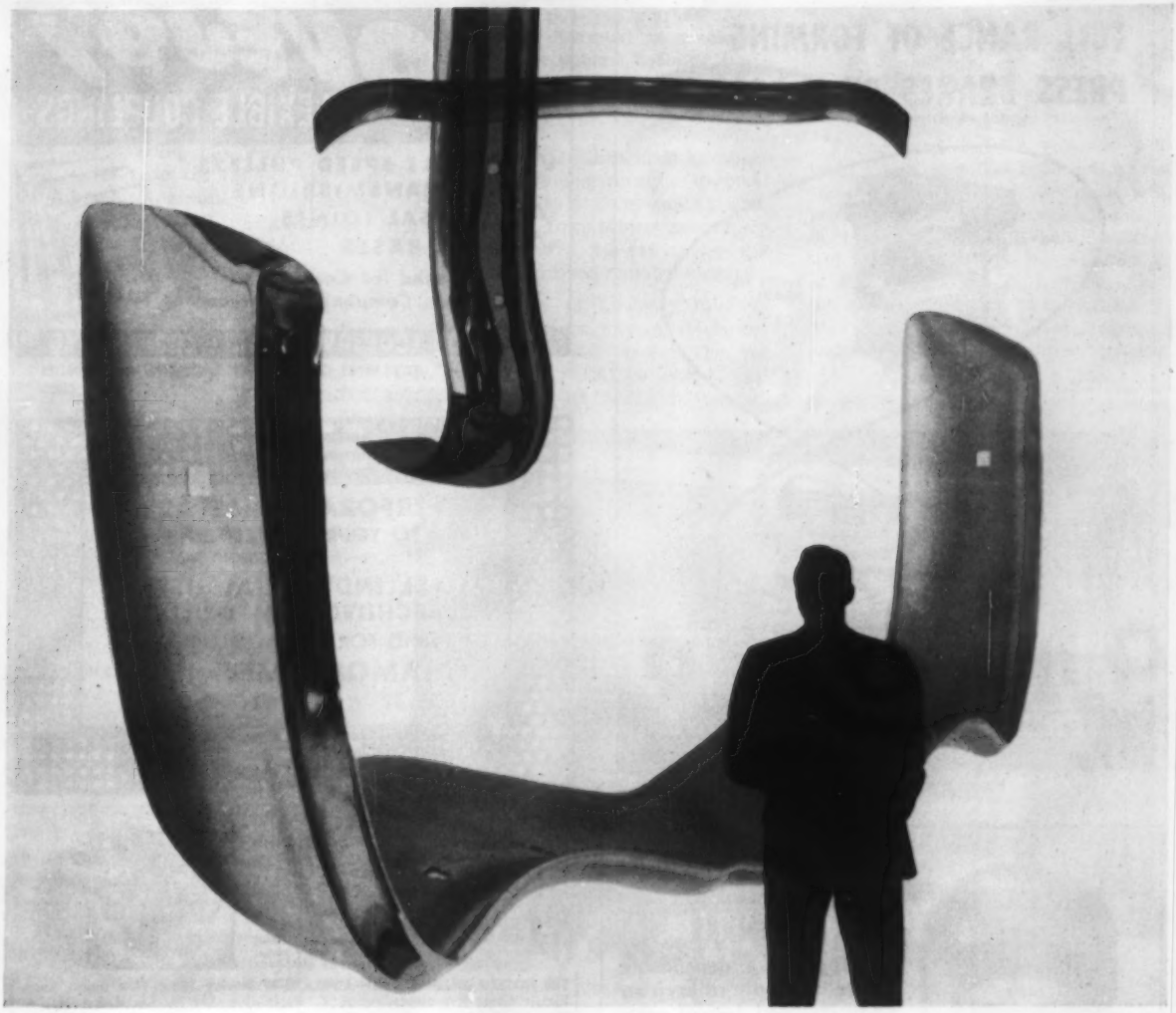
Morgan Spring Works, Wickwire-Spencer Division, Colorado Fuel & Iron Corp., will move from Worcester, Mass., to a $2-million plant being constructed in Palmer, Mass. Production of springs at Palmer will start before the year end. Wickwire-Spencer Division also has a rope plant at Palmer which has been supplying a substantial part of the wire for springs produced at the Worcester plant.

Tin Plate . . .

Tin Plate Prices, Page 102

Consumers are rushing to build up sufficient stocks of tin plate before the deadline for negotiations between the union and steel producers. Although there is small chance of a strike, canners are securing enough of the product from mill production lines and warehouses to meet anticipated needs.

Despite the current rush in shipments, producers expect demand to continue high through the third quarter.



Deep-draw costs come down—fast . . .

. . . thanks to the Pennsalt FOS Process. Any way you look at it, severe deep-drawing of automobile parts, such as these bumpers, is being made easier, cleaner, and more economical by modern Pennsalt drawing lubricants. Steel strip comes to the dies pre-coated with Foscoat 40 and Drawcote. Foscoat is a phosphatizing compound that prepares the work for the appropriate dry FOS lubricant; Drawcote (product of Pennsalt's newly-acquired Gilron Division) forms a dry, homogeneous protective and lubricating film to speed the most severe drawing operation.

With these two Pennsalt chemicals, the auto industry is deep-drawing, stamping, and extruding steel parts at much lower cost than was previously possible. Die life is greatly increased. Plating is smoother with less finish buffing, because drawn parts are freed from die seizures, scratching, and irregularities. And these modern *dry* lubricants make the press shop a cleaner, safer place to work in.

For the severest deep draws in ferrous metals, the combination of Foscoat and Drawcote is literally working wonders. For lighter draws, and for certain special applications, Drawcote *alone* is recommended. With the full FOS line (Fosclean, Fosrinse,® Fospray, Foscoat,® Drawcote,® Foslube®), Pennsalt offers a process to meet every ferrous metal drawing requirement. And what is more, metal pre-coated with the FOS Process seldom needs re-coating for the next press stages.

For information on the Pennsalt FOS Process to fit *your* drawing or stamping needs, send blueprints of parts you're cold-forming, and give us details on type of steel, length of run. No obligation, of course. Customer Service Department, Pennsylvania Salt Manufacturing Company, 1100 Widener Building, Philadelphia 7, Pa.

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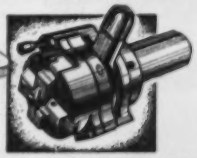

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Scrap . . .

Scrap Prices, Page 118

Philadelphia—While prices on several grades of steel scrap have eased, some leading trade interests believe that the market has reached bottom, at least for the time being. The yard intake is definitely off in some cases as much as 50 per cent, compared with a few weeks ago.

Latest adjustment in the major open-hearth grades came as a result of the purchase of 40,000 tons by the Fairless, Pa., consumer. The Fairless requirements comprised No. 1 heavy melting, No. 1 bundles, No. 1 busheling and No. 2 bundles. The No. 1 grades were bought at $1 a ton under the prices paid by Fairless a few weeks previously, and brought the market on these grades down to a flat $35.50, delivered price, compared with the recent spread of $35.50-$36.50.

While this consumer's purchase of No. 2 bundles was off $1 from its previous order, it has had the effect of raising the general market average for this material. Instead of a flat price of $26.50, the market now is $26.50-$28, delivered; the latter price represents what was paid by Fairless. Trade reports indicate this mill had to pay more for its No. 2 bundles than the going market to obtain the price it was willing to pay for the larger quantities of No. 1 grades of steel scrap.

Pittsburgh—Mills have no interest in building scrap stocks at this time. There is uncertainty about labor negotiations.

Cleveland—Scrap prices are unchanged in the absence of buying. Industrial lists are closing and a sounder appraisal of the market can be made after they are completed.

Buffalo—With mill buying absent, steelmaking grades of scrap declined $1 a ton last week on small sales. Prices declined despite the continued high rate of steel production. Large reserve stocks at mills and anticipated boat receipts are major bearish factors.

New York—Brokers' buying prices are easier at $30-$31 for No. 1 heavy melting and No. 1 bundles. Mixed borings and short turnings are off to $13-$14. Other grades are unchanged.

Boston—Scrap buying is slow here despite heavy consumption. Prices are more stabilized but are hovering around the recent lows. No. 1 heavy melting is quoted at $27, shipping point, for eastern Pennsylvania destinations and $29 for district mills.

Chicago—The scrap market seems to have been disowned as a relative of the steel producers' booming business family. Although prices haven't changed, outlook for scrap remains weak.

Cincinnati—Machine shop turnings and short shoveling turnings dropped $1 last week to $18-$19 and $21-$22, respectively. Drop broken machinery moved up $1 to $45-$46 under the impact of improved foundry business.

Los Angeles—A tendency to softness due to oversupply of steelmaking scrap is noted here. The reverse is true with the cast scrap market, which has firmed with increased purchases by foundries.

Tubular Goods . . .

Tubular Goods Prices, Page 104

Youngstown Sheet & Tube Co. will build a new seamless tube mill at its Indiana Harbor (Ind.) Works. It will produce pipe with outside diameter of 4½ to 9⅝-in. Mill and facilities will be housed in two main buildings of about 400,000 sq ft, both designed for future expansion. Each will house hot working and complete finishing and heat treating facilities. Unoffi-

(*Please turn to page* 120)

STOP RUST
STOP RUST
STOP RUST

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 25	$34.67
May 18	34.83
April Avg.	36.73
May 1954	28.00
May 1950	33.82

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	20.50-21.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 5 ft lengths	39.00-40.00
Heavy turnings	33.00-34.00
Punchings & plate scrap	39.00-40.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 2 ft and under	*48.00-49.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, random lengths	*44.00-45.00*
Railroad specialties	*43.00-44.00*

Stainless Steel Scrap

18-8 bundles & solids	*215.00-225.00*
18-8 turnings	105.00-110.00
430 bundles & solids	*100.00-105.00*
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	31.00-32.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	43.00-44.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	44.00-45.00
Burnt cast	32.00-33.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 2-ft and under	49.00-50.00
Rails, 18-in. and under	50.00-51.00
Rails, random lengths	44.00-45.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	43.00-44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings	16.00-17.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	35.00-36.00
Electric furnace bundles	34.00-35.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	33.00-35.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	32.00-33.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-35.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	33.00-34.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 2-ft and under	49.00-50.00
Rails, 18-in. and under	50.00-51.00
Angles, splice bars	43.00-44.00
Rails, rerolling	51.00-52.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids	105.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended May 25)

No. 1 Heavy Melting	High	Low	Close
Oct.	36.00	35.50	36.00*
Jan.			

Sales (160-ton units): 1 October.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.50
No. 2 heavy melting	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	19.00-20.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths	42.00-43.00
Angles, splice bars	43.00-44.00
Stand. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	*35.50*
No. 2 heavy melting	32.50
No. 1 bundles	*35.50*
No. 2 bundles	*26.50-28.00*
No. 1 busheling	*35.50*
Electric furnace bundles	39.50
Machine shop turnings	21.50
Mixed borings, turnings	21.50
Short shovel turnings	24.00-25.00
Structurals & plate	40.00-41.00
Heavy turnings	34.00-35.00
Couplers, springs, wheels	*40.50-41.00*
Rails crops, 2 ft & under	*50.00-51.00*

Cast Iron Grades

No. 1 cupola	*36.00-38.00*
Malleable	44.00
Heavy breakable cast	40.00-41.00
Drop broken machinery	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	27.00-27.50
No. 1 bundles	*30.00-31.00*
No. 2 bundles	22.00-23.00
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	*13.00-14.00*
Short shovel turnings	15.00-16.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	22.00-23.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	235.00-240.00
18-8 borings, turnings	105.00-110.00
430 sheets, clips, solids	95.00-100.00
410 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.00-28.50
No. 2 heavy melting	21.00-22.00
No. 1 bundles	27.00-28.00
No. 2 bundles	16.00-17.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	33.00-34.00

BUFFALO

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*29.00-30.00*
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	*32.00-33.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	27.00-28.00
No. 1 bundles	31.50-32.50
No. 2 bundles	21.00-22.00
No. 1 busheling	31.50-32.50
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	17.50-18.50
Short shovel turnings	*21.00-22.00*
Cast iron borings	17.50-18.50
Low phos., 18-in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.50-33.50
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	16.00
Short shovel turnings	18.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	*30.00*
Clean auto cast	*43.00*
Stove plate	34.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.50*
Rails, 18-in. and under	46.00
Rails, random lengths	40.00-41.00
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	28.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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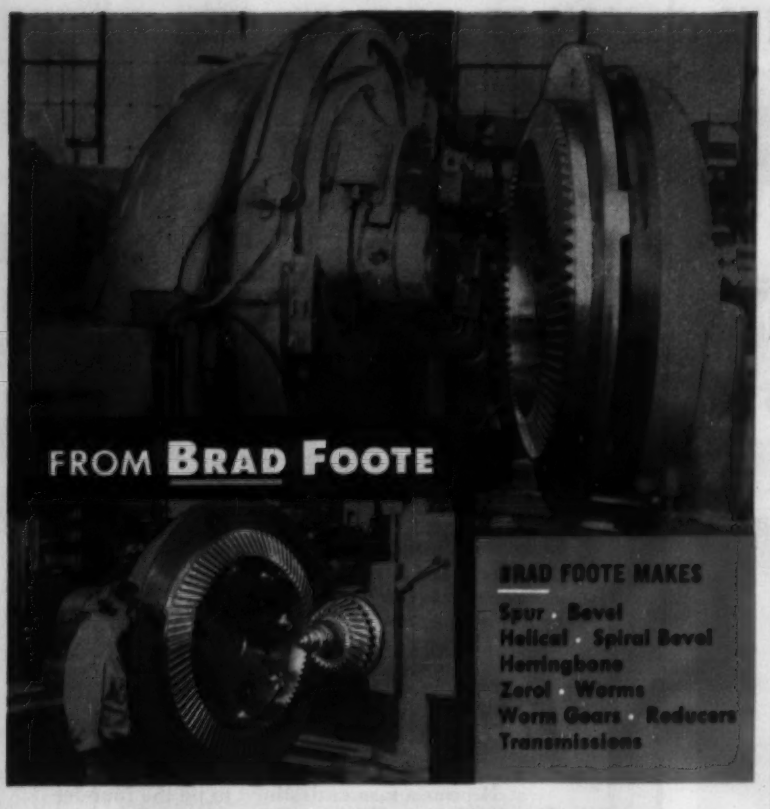

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(*Concluded from page* 117)

cial estimated cost: Over $10 million.

The strong surge of demand for oil country products continues. Mills are booked solidly through early August.

Pig Iron . . .

Pig Iron Prices, Page 105

Merchant pig iron sellers are winding up the best month so far this year. Business has included considerable protective buying because of prospects of higher prices by July, if not sooner.

The Birdsboro, Pa., stack of Colorado Fuel & Iron Corp. is expected to go into blast this week after being down for months.

The No. 2 blast furnace at Kaiser Steel Corp.'s mill at Fontana, Calif., went back into production May 24 after a 34-day relining job.

Blast furnaces operated at 92.4 per cent of capacity in April, producing 6,329,927 tons of pig iron and 54,712 tons of ferromanganese and spiegeleisen, reports the American Iron & Steel Institute, New York. This compared with 6,406,902 tons of pig iron and 57,049 tons of ferromanganese and spiegeleisen in March. Furnaces operated at 87.4 per cent during the first four months.

Iron Ore . . .

Iron Ore Prices, Page 114

Consumption of Lake Superior iron ore in April totaled 7,290,466 gross tons, reports the Lake Superior Iron Ore Association. The tonnage was the second highest on record for April.

Stocks of ore at furnaces and lower lake docks on May 1 amounted to 18,907,200 gross tons. At the April rate of consumption, this is equal to about a 2½-month supply.

Currently, 14 more ore vessels are in service on the Great Lakes than a year ago. The fleet is operating at 84.13 per cent of capacity, against 77.26 a year ago.

Warehouse . . .

Warehouse Prices, Page 105

May will prove to be the best month so far this year for most distributors. Stringency at the mills has forced more consumers to turn to warehouses, and, while particular pressure has been for plates and light, flat-rolled products, there has been brisk trading in bars and shapes, certain specialties and stainless steel sheets.

Comment by one Chicago distributor was: "Business is so good stocks of certain items are depleted, causing us to lose business. When you're

short of one item, you're apt to lose an entire order. Nobody likes to split an order when he doesn't have to." Warehouse inventories are nearing the danger point in sheets, plates and structurals.

Several large emergency orders have been handled by warehouses recently in Pittsburgh. Demand is expected to remain strong through June as consumers replenish inventories. Currently, such stocking by suppliers to automakers is boosting sales of sheets and bars.

In Los Angeles, an unanticipated pickup in demand foreshadows some shortages in sizes of some products.

Structural Shapes . . .

Structural Shape Prices, Page 100

Activity in the structural market is spotty in the East. Substantial bridge work is pending, and, in general, fabricating shops have fairly comfortable order backlogs. Most bridge tonnage is shopped around, with turnpike jobs going between 11.00c and 12.00c—nearer the former in recent lettings, including one contract for about 5000 tons.

For private buildings, prices are somewhat firmer where delivery is a factor. Fabricating shops find few openings for wide flanged beams through the third quarter; channels under 8 in. are in about the same position.

In the Pacific Northwest, an impressive total of unplaced business is reported. Fabricators have a three-month order backlog.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4000 tons, 25 bridges, Massachusetts turnpike, Stockbridge - West Stockbridge - Lee, Mass., to Ernst Construction Corp., Buffalo; B. Perini & Sons Inc., Framingham, Mass., general contractor.

3860 tons, New Jersey turnpike, contract PE-4, Burlington county, through Franklin Contracting Co., to American Bridge Div., United States Steel Corp., Pittsburgh.

2665 tons, plant addition, Western Electric Co., Allentown, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

2240 tons, air conditioning equipment plant, General Electric Co., Tyler, Tex., to Consolidated Western Steel Div., United States Steel Corp., Pittsburgh.

2135 tons, contract 8, Long Sault dam, Massena, N. Y., for New York State Power Authority, through Walsh Construction et al, general contractors, to Fort Pitt Bridge Works, Pittsburgh.

1600 tons, apartment, E. 79th street, Manhattan, New York, through H. R. H. Construction Co., to American Bridge Div., United States Steel Corp., Pittsburgh.

1500 tons, superstructure, Lanier bridge, Buford Dam, Ga., to Bristol Steel & Iron Works, Bristol, Va.

1115 tons, contract 9, Massena, N. Y., for New York State Power Authority, through Merritt-Chapman & Scott Corp., general contractor, to Fort Pitt Bridge Works, Pittsburgh.

750 tons, two 3-span and one 5-span stringer bridges, state project, Canton-Dedham-Westwood, Mass., to Tower Iron Works, Providence, R. I.; J. F. White Contracting Co., Cambridge, Mass., general contractor.

700 tons, Sinclair Refining Co., Marcus Hook,

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Pa., to Frank M. Weaver & Co., Lansdale, Pa.

640 tons, apartment, 55th street and First avenue, Manhattan, New York, through Jarcho Bros., to Grand Iron Works, Bronx, that city.

520 tons, Bank for Savings, E. 21st street, Manhattan, New York, through Cuzzi Bros. & Singer, to Schacht Steel Construction Inc., that city.

500 tons, grain storage facilities, Longview, Wash., to Isaacson Iron Works, Seattle; Hart Construction Co., Longview, general contractor.

450 tons, 2.5-million bbl grain storage building, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle, for Coast Storage Inc.; Cawdrey & Vemo, Seattle, general contractors.

445 tons, Hempstead Junior High School, Belmont, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa., through Rames Construction Co., general contractor.

430 tons, manufacturing building, American Die Co., Rockville, Conn., to Standard Structural Steel Co., Hartford, Conn.; Bartlett & Brainerd Co., Hartford, general contractor.

425 tons, National Aniline Division, American Chemical & Dye Corp., Moundsville, W. Va.; 285 tons for a plant building going to Frank M. Weaver & Co., Lansdale, Pa., and 140 tons of pipe supports, to Vulcan Rail & Construction Co., Maspeth, N. Y., with branch plants in West Virginia; United Engineers & Constructors, Philadelphia, engineers in charge.

400 tons, two pump plants, Hanford Works, to Gate City Iron Works, Boise, Idaho; Hoffman Construction Co., Portland, Oreg., general contractor, low bidder to Atomic Energy Commission, $1,592,985.

270 tons, warehouse, General Electric Co., Philadelphia, to Ingalls Steel Construction Co., Verona, Pa.

260 tons, manufacturing building, Porto Construction Co., New Haven, Conn., to Connecticut Steel Co., New Haven.

225 tons, YMHA, New York, through Cauldwell-Wingate, general contractor, to Grand Iron Works, Bronx, that city.

190 tons, state highway work, Franklin county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, Navy Purchasing Office, Washington, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

9330 tons, bridge structures, Indiana toll road, Hammond-East Chicago section; bids June 1, Indianapolis.

8000 tons, 63 spillway and control gates, six stop logs, Long Sault and Iroquois dams, St. Lawrence river project; bids June 17, New York Power Authority, New York; delivered to sites; erection by others.

7000 tons, contract G-4, New Jersey approach work, Philadelphia-Gloucester bridge; bids closed by Delaware River Port Authority June 9. This project was referred to recently as involving 6500 tons.

1000 tons, bridges, Massachusetts turnpike, Chicopee, Mass.; L. G. DeFalice & Sons, New Haven, Conn., low, general contractors.

1000 tons, state highway work, Route 42, Gloucester county, New Jersey; Public Constructors Inc., Pleasantville, N. J., low on general contract.

750 tons, two 3-span and one 5-span stringer bridges, Canton-Dedham-Westwood, Mass.; J. F. White Contracting Co., Cambridge, Mass., low on general contract; also 340 tons, reinforcing bars.

700 tons, Owens-Illinois Glass Co., factory and warehouse, Portland, Oreg.; Anderson-Westfall Co., Portland, low, for general contract.

600 tons, state highway bridges, Waterbury, Conn.; bids June 2, Hartford, Conn.

210 tons, four state highway bridges, Dennis-Harwich-Brewster, Mass.; Campanella & Cardi Construction Co., Hillsgrove, R. I., low on general contract; also 100 tons, reinforcing bars.

REINFORCING BARS . . .

REINFORCING BARS PLACED

400 tons, Missoula, Mont., high school, to Soule Steel Co., Seattle.

REINFORCING BARS PENDING

2170 tons, bridge structures, Indiana toll road, Hammond-East Chicago section; bids June 1, Indianapolis; also, 155,000 linear feet, steel piling, and 29,000 linear feet, metal handrail.

350 tons, special facilities, Greater Hartford, Conn., area; bids to U. S. Engineer, Boston, June 3.

330 tons, state bridge work, Butler-Armstrong counties, Pennsylvania; bids June 10.

PLATES . . .

PLATES PLACED

1650 tons, four floating roof tanks, Sinclair Refining Co., Marcus Hook, Pa., to Chicago Bridge & Iron Co., Greenville, Pa.

730 tons, fabricated steel pipe, Department of Water Supply, Gas & Electricity, New York, for installation in Queens, through the Oakhill Contracting Co., to Alco Products Inc. (formerly American Locomotive Co.), that city.

520 tons, towers and drums, Houston, Tex., for M. W. Kellogg Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

335 tons, two oil tanks, Wyatt Inc., New Haven, Conn., to Hammond Iron Works, Warren, Pa.

135 tons, standpipe, Fairlawn Finishing Co., Fairlawn, N. J., to an unnamed fabricator.

PLATES PENDING

125 tons, aircraft fuel storage tank, Columbus Airfield Base, Miss.; bids June 9 to U. S. Engineer, Mobile, Ala.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, system expansion, Anchorage, Alaska; Macri-Montgomery Co., Anchorage, low $550,136, to Alaska Public Works, Juneau.

STEEL PIPE PLACED

285 tons, 30-in. steel pipe for a river crossing at Conshohocken, Pa., for the Philadelphia Suburban Co., Bryn Mawr, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

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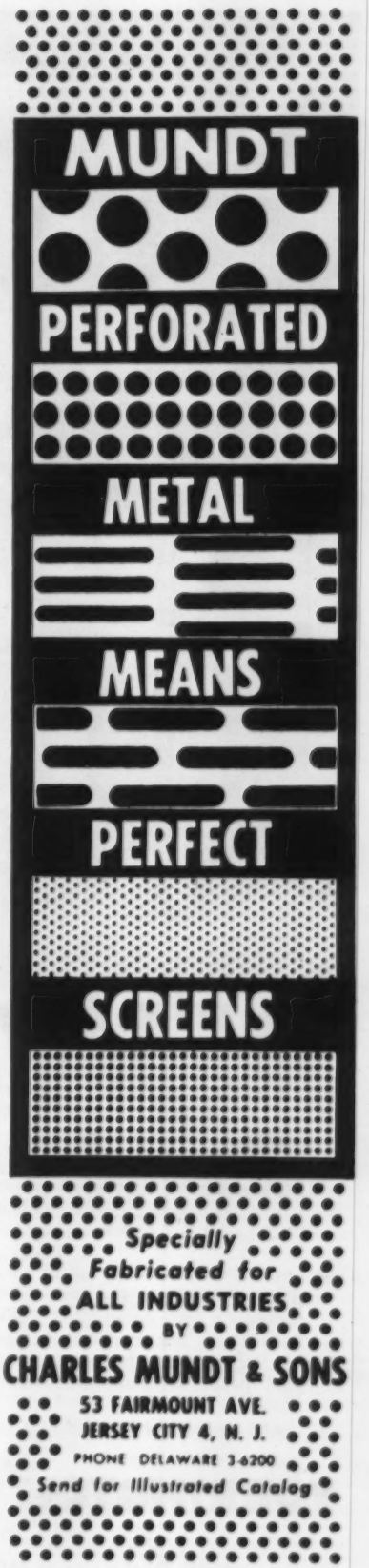

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No. 169

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